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OFFICIAL GAZETTE

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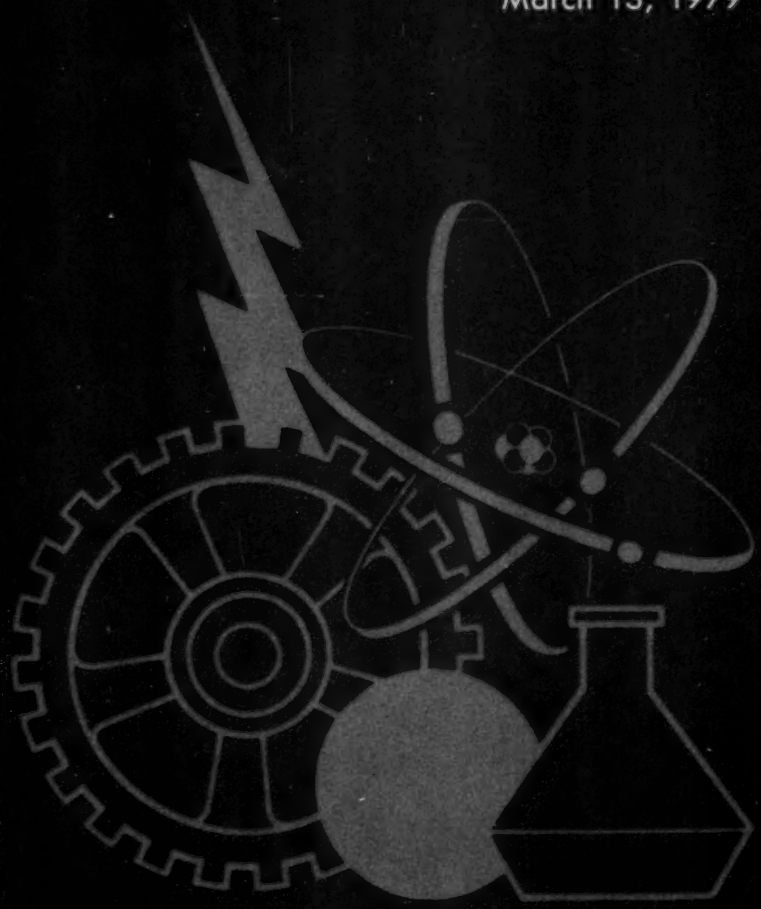
PATENTS

March 13, 1979



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

March 13, 1979 Volume 980 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) : Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of October 3, 1978.

DONALD W. BANNER.

Nov. 7, 1978. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

D. 247,834, Re. S.N. 000,567, Filed Jan. 2, 1979, Cl. D6/62, SOFA, Lester Beall, Jr., Owner of Record: *Crestline Furniture Company Inc., Valdese, N.C.,* Attorney or Agent: Timothy L. Tilton, et al., Ex. Gp.: 290

3,459,105, Re. S.N. 001,690, Filed Jan. 8, 1979, Cl. 93/51 M, METHOD AND APPARATUS FOR PRODUCING GLUED FOLDED BOXES, Wilhelm Waldbauer, Owner of Record: *by mesne assigts., to Hoague-Sprague Leasing Company, Andover, Mass.,* Attorney or Agent: Stanley Sacks, et al., Ex. Gp.: 324

3,696,744, Re. S.N. 969,312, Filed Dec. 14, 1978, Cl. 101/415.1, SADDLE LOCKUP FOR FLEXIBLE PRINTING PLATE, Gordon Etchell, Owner of Record: *Rockwell International Corporation, Pittsburgh, Pa.,* Attorney or Agent: James E. Nolan, Ex. Gp.: 337

3,802,931, Re. S.N. 974,529, Filed Dec. 29, 1978, Cl. 148/11.5 A, LOW-EARING CAN STOCK, Linton D. Bylund, Owner of Record: *Reynolds Metals Co., Richmond, Va.,* Attorney or Agent: John F. C. Glenn, et al., Ex. Gp.: 111

3,897,491, Re. S.N. 000,854, Filed Jan. 4, 1979, Cl. 260/543, PROCESS FOR PREPARING ALKYL OR ARYL PHOSPHORUS HALIDES AND MIXED ISOMERS THEREOF, Arthur D. F. Toy, et al., Owner of Record: *Stauffer Chemical Company, New York, N.Y.,* Attorney or Agent: Daniel Soritis, et al., Ex. Gp.: 126

4,010,477, Re. S.N. 002,654, Filed Jan. 11, 1979, Cl. 346/75, HEAD ASSEMBLY FOR A JET DROP RECORDER, James A. Frey, Owner of Record: *The Mead Corporation, Dayton, Ohio,* Attorney or Agent: Lawrence B. Biebel, et al., Ex. Gp.: 211

4,036,632, Re. S.N. 001,029, Filed Jan. 2, 1979, Cl. 71/93, HERBICIDAL AGENTS, Kurt Westphal, et al., Owner of Record: *Bayer Aktiengesellschaft Corporation, Leverkusen, Germany,* Attorney or Agent: Arnold Sprung, et al., Ex. Gp.: 124

4,061,046, Re. S.N. 966,474, Filed Dec. 14, 1978, Cl. 74/217 B, PEDAL-ACTUATED BICYCLE GEAR SHIFT MEANS, Richard A. Lang, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 352

4,087,521, Re. S.N. 001,800, Filed Jan. 8, 1979, Cl. 424/211, ARTHROPODICIDAL AND NEMATOCIDAL PHOSPHORAMIDATES, Harold Ernest Aller, et al., Owner of Record: *Rohm and Haas Company, Philadelphia, Pa.,* Attorney or Agent: Robert A. Doherty, et al., Ex. Gp.: 125

4,091,962, Re. S.N. 001,107, Filed Jan. 5, 1979, Cl. 220/326, PANEL HOLE CLOSURE, Harold S. van Buren, Jr., Owner of Record: *TRW Inc., Cleveland, Ohio,* Attorney or Agent: James R. O'Connor, et al., Ex. Gp.: 241

PATENT NOTICES

Certificates of Correction for the Week of Mar. 13, 1979

Re. 29,764	4,101,486	4,108,806	4,119,864
D. 248,249	4,101,671	4,109,380	4,119,982
D. 248,555	4,101,990	4,109,771	4,120,188
D. 248,793	4,102,403	4,109,823	4,120,575
3,874,422	4,102,648	4,110,085	4,120,703
3,972,789	4,102,698	4,110,170	4,120,917
3,979,437	4,102,850	4,110,287	4,121,014
3,988,333	4,102,983	4,110,403	4,121,090
4,000,681	4,103,233	4,110,417	4,121,307
4,020,213	4,103,535	4,110,460	4,121,462
4,024,131	4,103,930	4,110,530	4,121,844
4,025,373	4,103,978	4,110,586	4,121,923
4,026,724	4,104,047	4,110,597	4,122,098
4,034,772	4,104,184	4,110,790	4,122,099
4,036,375	4,104,245	4,112,576	4,122,284
4,039,245	4,104,309	4,112,802	4,122,888
4,042,563	4,104,591	4,113,778	4,123,165
4,043,245	4,104,608	4,114,264	4,123,299
4,054,845	4,104,725	4,114,332	4,123,462
4,060,881	4,104,751	4,114,444	4,123,645
4,066,570	4,104,964	4,114,756	4,123,989
4,067,995	4,105,096	4,114,950	4,124,248
4,069,126	4,105,281	4,115,674	4,124,265
4,081,027	4,105,368	4,115,751	4,124,359
4,082,819	4,105,642	4,115,987	4,124,621
4,084,691	4,105,717	4,116,098	4,124,686
4,086,887	4,105,913	4,116,272	4,124,913
4,087,458	4,105,949	4,116,409	4,125,110
4,087,732	4,105,998	4,116,459	4,125,259
4,087,761	4,106,008	4,117,025	4,125,271
4,090,248	4,106,104	4,117,115	4,125,521
4,090,503	4,106,198	4,117,242	4,125,538
4,092,442	4,106,230	4,117,377	4,125,620
4,092,508	4,106,317	4,117,551	4,125,755
4,092,976	4,106,384	4,117,756	4,125,789
4,093,205	4,106,630	4,118,029	4,125,898
4,094,442	4,106,686	4,118,091	4,126,040
4,094,521	4,106,730	4,118,481	4,126,474
4,095,155	4,106,884	4,118,485	4,126,695
4,095,381	4,107,002	4,118,524	4,126,841
4,096,139	4,107,364	4,118,536	4,127,203
4,096,243	4,107,374	4,118,591	4,127,394
4,097,277	4,107,711	4,118,592	4,127,715
4,097,766	4,107,934	4,118,817	4,127,800
4,098,188	4,108,336	4,118,888	4,127,956
4,098,325	4,108,364	4,119,635	4,128,333
4,099,005	4,108,369	4,119,648	4,132,468
4,100,591	4,108,380	4,119,710	
4,101,438	4,108,410	4,119,737	

Disclaimer

4,107,155.—*George Leland Fletcher,* Pittsford and *Stewart H. Merrill,* Rochester, N.Y. POLYSULFONAMIDES. Patent dated Aug. 15, 1978. Disclaimer filed Dec. 18, 1978, by the assignee, *Eastman Kodak Company.*

Hereby enters this disclaimer to all claims of said patent.

Disclaimer and Dedication

4,123,831.—*William Patrick Covington,* Burnsville, Minn. LIGHTWEIGHT DISPOSABLE TRANSPORTATION CASKET. Patent dated Nov. 7, 1978. Disclaimer and dedication filed Dec. 19, 1978, by the assignee, *National Car Rental System, Inc.*

Hereby disclaims and dedicates to the public the entire remaining term of said patent.

Patents Available for Licensing or Sale

3,469,982. PROCESS FOR MAKING PHOTORESISTS. Jack Richard Celeste. Correspondence to: Mr. Edwin Tocker, Legal Department, E. I. du Pont de Nemours & Company, Wilmington, Del. 19898.

3,863,243. SLEEP ALARM FOR DRIVERS. Max Skolnick, 19–30 Parson Blvd., Whitestone, N.Y. 11357.

3,973,864. TIDE MOTOR. Dewitt T. Atherton, 407 West E St., Encinitas, Calif. 92024.

3,991,700. RUBBER ATTACHMENT FOR OUTBOARD MOTOR. Paul A. Bourgeois and William T. Clearly, 130 W. Baraga Ave., Marquette, Mich. 49855.

3,995,796. LANTERN HOLDER AND WASH PAN STAND DEVICE. George W. Kline, 6 Evans Road, Chillicothe, Ohio 45601.

4,032,770. PORTABLE TABLE AND LAMP FIXTURES FOR MOBILE HOME OR BOATS. Gloria Astrid Millette, 25660 Southfield Road, #B–1, Southfield, Mich. 48075.

4,086,706. FEEDING AND TREATING SYSTEM. Ingenieur-Buro Margarete Lesk, Osterburken, Germany, Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,094,078. PARTICLE FEEDING AND TREATING SYSTEM. Ingenieur-Buro Margarete Lesk, Osterburken, Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,095,099. ADDITIVE COLOR SYSTEM WITH COMPENSATION OF REPEATABILITY ERRORS OF VARIABLE DENSITY ELECTRO-OPTICAL FILTER UNITS. Anamorphic Ltd., 70–2 Austin St., Forest Hills, N.Y. 11375. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

The following two patents are offered by Salvatore Sapienza, 128 Common St., Lawrence, Mass. 01841.

3,889,944. SWING CONSTRUCTION.

3,623,264. PUSH TOY.

The following two patents are offered by Henry B. Maier, 6 Sealey Ave., Hempstead, N.Y. 11550.

4,137,096. LOW COST SYSTEM FOR DEVELOPING SOLAR CELLS.

4,137,901. SOLAR ENERGY COLLECTING AND TRAPPING APPARATUS FOR HOME HEATING OR COOLING.

General Electric Company is prepared to grant nonexclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to General Electric Company, Aircraft Engine Group, 1000 Western Ave., Lynn, Mass. 01910. Attention: Patent Counsel.

3,419,952. METHOD FOR MAKING COMPOSITE MATERIAL.

3,471,270. COMPOSITE MATERIAL AND METHOD FOR MAKING.

3,495,915. PHOTOELECTRIC PROBE DETECTING AND MEASURING APPARATUS.

3,540,878. METALLIC SURFACE TREATMENT MATERIAL.

3,547,455. ROTARY SEAL INCLUDING ORGANIC ABRADABLE MATERIAL.

3,620,836. BOROCARBON-COATED FILAMENTS.

3,703,808. TURBINE BLADE TIP COOLING AIR EXPANDER.

3,718,962. HIGH TEMPERATURE METALLIC DIFFUSION COATING.

3,719,538. METHOD OF FORMING A COMPOSITE METALLIC PREFORM TAPE.

3,720,551. METHOD FOR MAKING A DISPERSION STRENGTHENED ALLOY ARTICLE.

3,722,216. ANNULAR SLOT COMBUSTOR.

3,750,396. VORTEX VALVE FUEL DISTRIBUTION SYSTEM FOR GAS TURBINE ENGINES.

3,753,790. HEAT TREATMENT TO DISSOLVE LOW MELTING PHASES IN SUPERALLOYS.

3,762,030. METHOD FOR MAKING A FRICTION WELDED ARTICLE.

3,767,470. MULTICOMPONENT EUTECTICS FOR HIGH TEMPERATURE APPLICATIONS.

3,768,147. METHOD OF FRICTION WELDING.

3,782,928. COMPOSITE ALLOY FOR HIGH TEMPERATURE APPLICATIONS.

3,783,032. METHOD FOR PRODUCING DIRECTIONALLY SOLIDIFIED NICKEL BASE ALLOY.

3,783,033. RAPID SOLIDIFICATION TO IMPROVE THE OXIDATION RESISTANCE OF DIRECTIONALLY SOLIDIFIED EUTECTIC ALLOYS.

3,793,008. MONOCARBIDE FIBER-REINFORCED IRON-BASE SUPERALLOY COMPOSITE EUTECTIC CASTINGS AND METHOD.

3,793,012. NICKEL-BASE TANTALUM CARBIDE EUTECTIC ALLOYS.

3,793,013. COBALT-BASE TANTALUM CARBIDE EUTECTIC ALLOYS.

3,799,768. METHOD OF MAKING MONOCARBIDE FIBER-REINFORCED COBALT-BASE SUPERALLOY COMPOSITE EUTECTIC CASTINGS.

3,799,769. METHOD OF MAKING MONOCARBIDE FIBER-REINFORCED NICKEL-BASE SUPERALLOY COMPOSITE EUTECTIC CASTINGS.

3,819,295. COOLING SLOT FOR AIRFOIL BLADE.

3,825,364. POROUS ABRADABLE TURBINE SHROUD.

3,841,942. APPARATUS FOR FORMING A COMPOSITE METALLIC PREFORM TAPE.

3,873,168. LAMINATED COMPOSITE ARTICLE WITH IMPROVED BEARING PORTION.

3,928,030. COBALT-TUNGSTEN HIGH TEMPERATURE EUTECTIC ALLOY.

3,933,481. HIGH-TEMPERATURE EUTECTOID ALLOY AND PROCESS OF MAKING.

3,934,322. METHOD FOR FORMING COOLING SLOT IN AIRFOIL BLADES.

3,936,550. COMPOSITE METALLIC PREFORM TAPE.

3,964,568. GAS TURBINE ENGINE NOISE SHIELD.

3,964,569. GAS TURBINE ENGINE NOISE SHIELD.

3,966,354. THERMAL ACTUATED VALVE FOR CLEARANCE CONTROL.

3,966,357. BLADE BAFFLE DAMPER.

3,982,854. FRICTION WELDED METALLIC TURBOMACHINERY BLADE ELEMENT.

4,019,832. PLATFORM FOR A TURBOMACHINERY BLADE.

4,020,538. TURBOMACHINERY BLADE TIP CAP CONFIGURATION.

4,023,731. THERMAL ACTUATED VALVE FOR CLEARANCE CONTROL.

4,026,472. CONVERGENT-DIVERGENT PLUG NOZZLE.

4,037,990. COMPOSITE TURBOMACHINERY ROTOR.

4,038,625. MAGNETIC INDUCTIVELY-COUPLED CONNECTOR.

4,038,817. FUEL JETTISON SYSTEM.

4,062,185. METHOD AND APPARATUS FOR WINDMILL STARTS IN GAS TURBINE ENGINES.

4,062,186. APPARATUS FOR WINDMILL STARTS GAS TURBINE ENGINES.

4,118,136. APPARATUS FOR ATTACHING TUBING TO A ROTATING DISK.

Applications for license may be addressed to: Division Patent Counsel, Switchgear & Distribution Tranformer Division, General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa. 19142.

3,883,838. HIGH-CURRENT CURRENT-LIMITING FUSE.

3,999,109. D-C MOTOR CONTROL CIRCUIT.

4,030,055. ELECTRIC CIRCUIT BREAKER WITH ELECTRO-MAGNETIC MEANS FOR OPPOSING MAGNETIC CONTACT-REPULSION FORCES.

4,032,870. ELECTRIC CIRCUIT BREAKER WITH ELECTRO-MAGNETIC-ASSIST MEANS FOR OPPOSING MAGNETIC CONTACT SEPARATING FORCES.

Applications for license may be addressed to Group Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky. 40225.

2,825,373. DISHWASHER ASSEMBLY.

3,985,023. DOOR LATCH CONTROL MEANS FOR A DISHWASHER.

3,993,621. REINFORCED STYRENE ACRYLONITRILE COPOLYMER HAVING IMPROVED TEMPERATURE RESISTANT PROPERTIES.

3,996,434. HOUSEHOLD FREEZER DOOR ALARM SWITCH HAVING AN AUTOMATIC RESETTING DEACTIVATOR.

4,103,192. HEAT DISSIPATING MOTOR MOUNTING ARRANGEMENT.

4,106,341. LINEARIZED THERMISTOR TEMPERATURE MEASURING CIRCUIT.

4,107,833. STRUCTURAL SUPPORT FOR A REFRIGERATOR.

4,114,065. REFRIGERATOR CABINET AND METHOD OF CONSTRUCTING.

4,120,550. MULLION ADJUSTING DEVICE.

4,122,323. PHASE SHIFT DEVICE MICROWAVE OVEN DOOR SEAL.

4,124,125. ADVANCING APPARATUS FOR SPINE FIN TUBING.

4,124,187. SUPPORT STRUCTURE FOR A CABINET.

4,129,996. VENT SYSTEM FOR A SELF-CONTAINED AIR CONDITIONER.

4,132,440. LOCKING ARRANGEMENT FOR A HOUSEHOLD REFRIGERATOR.

4,134,627. FOAM IN PLACE BREAKER STRIPS.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to RCA Corporation, Staff Vice-President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y. 10036.

4,118,598. AMPLITUDE MODULATED IMPATT DIODE OSCILLATOR AND A LOW COST COMMUNICATION SYSTEM USING SAME.

4,118,649. TRANSDUCER ASSEMBLY FOR MEGASONIC CLEANING.

4,118,656. NORTH-SOUTH PINCUSHION DISTORTION CORRECTION CIRCUIT.

4,118,700. SINGLE WIRE TRANSMISSION OF MULTIPLE SWITCH OPERATIONS.

4,118,720. SET-UP ARRANGEMENT FOR A COLOR TELEVISION RECEIVER.

4,118,731. VIDEO AMPLIFIER WITH SUPPRESSED RADIO FREQUENCY RADIATION.

4,119,807. DIGITAL TIME DIVISION MULTIPLEX SWITCHING SYSTEM.

4,119,812. SIGNAL DEFECT DETECTION AND COMPENSATION WITH SIGNAL DEEMPHASIS.

4,119,864. TOUCH SWITCH CIRCUITS.

4,119,882. CATHODE FOR FLAT PANEL DISPLAY.

4,119,924. SWITCHABLE CURRENT AMPLIFIERS.

4,119,925. FREQUENCY SYNTHESIZER WITH FREQUENCY MODULATED OUTPUT.

4,119,945. ERROR DETECTION AND CORRECTION.

4,119,961. CCD BINARY-TO-GRAY CODE GENERATOR.

4,119,992. INTEGRATED CIRCUIT STRUCTURE AND METHOD FOR MAKING SAME.

4,120,001. SYSTEM FOR PASSING TWO COLOR TV SIGNALS THROUGH NON-LINEAR PATH.

4,120,044. DATA ENCODING KEYBOARD.

4,120,567. ELECTRO-OPTIC DEVICE.

4,121,130. CATHODE STRUCTURE AND METHOD OF OPERATING THE SAME.

4,121,137. SYSTEM FOR ACHIEVING IMAGE UNIFORMITY IN DISPLAY DEVICES.

4,121,211. METHOD AND APPARATUS FOR DETERMINING A SIGNAL OF UNIFORM PERIOD.

4,121,257. CATHODE-RAY TUBE WITH DOUBLE TENSION BAND.

4,121,881. DUPLICATING A HOLOGRAPHIC RECORD BY USING TWO REFERENCE BEAMS.

4,122,368. CATHODE-RAY TUBE WITH A CORRUGATED MASK HAVING A CORRUGATED SKIRT.

4,122,400. AMPLIFIER PROTECTION CIRCUIT.

4,122,410. LATERAL MODE CONTROL IN SEMICONDUCTOR LASERS.

4,122,415. AM TRANSMITTER WITH AN OFFSET VOLTAGE TO THE RF STAGE TO COMPENSATE FOR SWITCHING TIME OF THE MODULATORS.

4,122,416. SHIELDED, D.C. ISOLATED RF CONNECTOR ASSEMBLY.

4,122,453. ANTENNA FEED NETWORK.

4,122,483. SEMICONDUCTOR DEVICE HAVING REDUCED LEAKAGE CURRENT.

4,122,485. METHOD AND APPARATUS FOR SIMULATING MAGNETIC ENVIRONMENT OF TELEVISION RECEIVERS.

4,122,489. SIGNAL DEFECT COMPENSATOR.

4,123,302. METHOD FOR DEPOSITING EPITAXIAL SEMICONDUCTOR FROM THE LIQUID PHASE.

4,123,713. MEMORY TYPE TUNING SYSTEM WITH PROVISIONS TO FACILITATE SETUP.

4,123,776. SERVICE SWITCH ARRANGEMENT FOR A A COLOR TELEVISION RECEIVER.

4,123,779. TURNTABLE ROTATIONAL SPEED AND PHASE CONTROL SYSTEM FOR A VIDEO DISC PLAY/RECORD APPARATUS.

4,131,827. POWER TRANSFER APPARATUS.

4,131,904. DEGRADATION RESISTANCE OF SEMICONDUCTOR ELECTROLUMINESCENT DEVICES.

4,128,247. STYLUS POSITION CONTROL SYSTEM.

4,128,784. BEAM GUIDE FOR DISPLAY DEVICE WITH BEAM INJECTION MEANS.

4,128,824. MULTILAYERED DEFLECTION YOKE.

4,128,834. RANGE MARK GENERATION.

4,128,865. D-C CONVERTER USING PULSED RESONANT CIRCUIT.

4,129,536. VINYL CHLORIDE BASED INJECTION MOLDING COMPOSITION.

4,129,628. METHOD OF MAKING A THERMOPLASTIC LENS BY VACUUM FORMING.

4,129,744. SOLDER CONNECTION BETWEEN COPPER AND ALUMINUM CONDUCTORS.

4,129,804. IMAGE DISPLAY DEVICE COMMPUTATOR.

4,129,806. CORRECTION CIRCUIT FOR LOAD DEPENDENT RASTER DISTORTION.

4,129,826. CIRCUIT TEST APPARATUS.

4,129,840. ARRAY OF DIRECTIONAL FILTERS.

4,129,871. CIRCULARY POLARIZED ANTENNA USING SLOTTED CYLINDER AND CONDUCTIVE RODS.

4,129,878. MULTI-ELEMENT AVALANCHE PHOTODIODE HAVING REDUCED ELECTRICAL NOISE.

4,130,338. HOLOGRAM HAVING EXPANDED VIEWING AREA.

4,130,347. FINE-LINE DIFFRACTIVE SUBTRACTIVE COLOR FILTERS.

4,130,783. SIDE PINCUSHION CORRECTION CIRCUIT WITH LOW DISSIPATION DAMPING.

4,130,802. UNDIRECTIONAL PHASE SHIFT KEYED COMMUNICATION SYSTEM.

4,130,886. CIRCUIT FOR REARRANGING WORD BITS.

4,131,021. HIGH RESOLUTION PULSE-ECHO ULTRASONIC-IMAGING DISPLAY SYSTEM.

4,131,022. PULSE-ECHO ULTRASONIC-IMAGING DISPLAY SYSTEM.

4,131,023. PULSE-ECHO ULTRASONIC-IMAGING DISPLAY SYSTEM.

4,131,024. PULSE-ECHO ULTRASONIC-IMAGING DISPLAY SYSTEM.

4,131,025. PULSE-ECHO ULTRASONIC-IMAGING DISPLAY SYSTEM.

4,131,496. METHOD OF MAKING SILICON ON SAPPHIRE FIELD EFFECT TRANSISITORS WITH SPECIFICALLY ALIGNED GATES.

4,131,698. PRETREATMENT OF POLYVINYL CHLORIDE PLASTIC FOR ELECTROLESS DEPOSITION.

4,131,822. CATHODE RAY TUBE WITH STRESS-RELIEVED SLOT-APERTURE SHADOW MASK.

4,131,823. MODULAR FLAT DISPLAY DEVICE WITH BEAM CONVERGENCE.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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	Sunnyvale Patent Library*	(408) 736-0795
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	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
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Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 27, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-2-78
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-16-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	5-1-78
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	1-23-78
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	11-28-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	11-2-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	10-4-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-4-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	9-5-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-23-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	3-17-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	12-22-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	2-21-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-12-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-11-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	11-2-77

Expiration of patents: The patents within the range of numbers indicated below expire during January 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,015,103 to 3,019,439, inclusive
Plant Patents..... Numbers 2,117 to 2,129, inclusive

REISSUES

MARCH 13, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

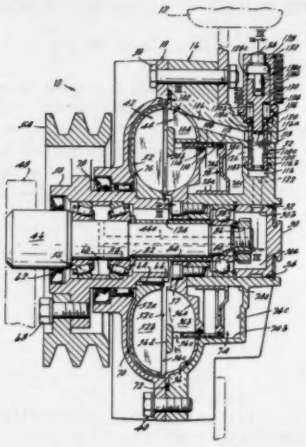
Re. 29,928
CONTROL FOR FLUID COUPLING

Warren G. Bopp, Farmington Hills, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Original No. 3,952,508, dated Apr. 27, 1976, Ser. No. 563,551, Mar. 31, 1975. Application for reissue Nov. 7, 1977, Ser. No. 849,192

Int. Cl.[2] F16D *33/00*

U.S. Cl. 60—330 **46 Claims**



1. A fluid coupling comprising:

a first rotatable member defining a housing rotatable about an axis;

a second member disposed in the interior of said housing and rotatable about said axis;

a working chamber defined by said members and containing an inventory of fluid for transmitting torque from one of said members to the other of said members via said fluid in response to relative rotation between said members;

a second chamber separate and distinct from said working chamber;

first and second passage means for communicating said working chamber with said second chamber;

control means including means moveable between *a* first *position unblocking one of said passages* and *a* second [positions] *position blocking said one passage* for varying the torque transmitted by said fluid; and

temperature sensing means radially disposed with respect to said axis and mounted on the exterior of said housing and including means operative to urge said moveable means between said first and second positions in response to changes in the temperature ambient to the exterior of said housing.

Re. 29,929
DEVIATED CONDUCTOR DRIVING SYSTEM

Lajos (Louis) Horvath, Norwich, England, assignor to Gurtler, Hebert & Co., Inc., New Orleans, La.

Original No. 4,027,734, dated Jun. 7, 1977, Ser. No. 639,857, Dec. 11, 1975. Application for reissue Mar. 13, 1978, Ser. No. 885,971

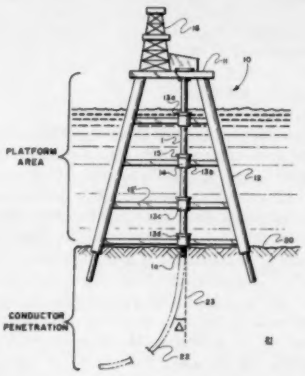
Int. Cl.[2] E21B *7/08*

U.S. Cl. 175—9 **12 Claims**

1. A method providing a deviated conductor system at an offshore body of water site for directional drilling of wells comprising the following steps:

a. providing an open ended conductor casing of incremental segments;

b. securing an open ended dog-leg section on the distal end of the otherwise straight conductor producing a longitudinally elongated, off-set portion extending over laterally past one side of the outer circumference of the otherwise straight conductor, said off-set being open ended;



c. [setting] *lowering* said conductor [through vertically aligned guides] *down* until the muoline is reached, maintaining or positioning the dog-leg in the desired directional orientation; and

d. driving said open ended conductor with said open ended dog-leg section through the substratum causing the conductor to be laterally deviated due to the interaction of the substratum against the offset, lower side surfaces of said dog-leg section from its entry into the substratum to its final deviated position.

Re. 29,930
DIRECT-POSITIVE SILVER HALIDE EMULSION FOGGED WITH LOW LEVELS OF REDUCTION AND GOLD FOGGING AGENTS

Bernard D. Illingsworth, deceased, late of Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Original No. 3,501,307, dated Mar. 17, 1970, Ser. No. 619,936, Mar. 2, 1967. Continuation-in-part of Ser. No. 533,448, Mar. 11, 1966, abandoned. Application for reissue Nov. 7, 1977, Ser. No. 849,374

Int. Cl.[2] G03C *1/36*

U.S. Cl. 96—100 N **49 Claims**

1. A direct-positive, photographic emulsion which comprises fogged silver halide grains and an organic desensitizer which has an anodic polarographic half-wave potential and a cathodic half-wave potential which, when added together, give a positive sum, said grains being such that a test portion thereof, when coated as a photographic silver halide emulsion on a support to give a maximum density of at least about 1 upon processing for 6 minutes at about 68° F. in Kodak DK-50 developer, has a maximum density which is at least about 30% greater than the maximum density of an identical coated test portion which is processed for 6 minutes at about 68° F. in Kodak DK-50 developer after being bleached for about 10 minutes at about 68° F. in a bleach composition of:

Potassium cyanide—50 mg.
Acetic acid (glacial)—3.47 cc.
Sodium acetate—11.49 g.
Potassium bromide—119 mg.
Water to 1 liter.

29. Fogged, photographic silver halide grains being such that a test portion thereof, when coated as a photographic silver halide emulsion on a support to give a maximum density of at least about 1 upon processing for 6 minutes at about 68° F. in Kodak DK-50 developer, has a maximum density which is at least about 30% greater than the maximum density of an identical coated test portion which is processed for 6 minutes at about 68° F. in Kodak DK-50 developer after being bleached for about 10 minutes at about 68° F. in a bleach composition of:

Potasssium cyanide—50 mg.
Acetic acid (glacial)—3.47 cc.
Sodium acetate—11.49 g.
Potassium bromide—119 mg.
Water to 1 liter.

39. A direct-positive photographic emulsion which comprises an electron acceptor in combination with fogged silver halide grains wherein at least 95% by weight or by number of the silver halide grains are of a size which is within about 40% of the mean grain size, said grains being such that a test portion thereof, when coated as a photographic silver halide emulsion on a support to give a maximum density of at least about 1 upon processing for 6 minutes at about 68° F. in Kodak DK-50 developer, has a maximum density which is at least about 30% greater than the maximum density of an identical coated test portion which is processed for 6 minutes at about 68° F. in Kodak DK-50 developer after being bleached for about 10 minutes at about 68° F. in a bleach composition of:

Potassium cyanide—50 mg.
Acetic acid (glacial)—3.47 cc.
Sodium acetate—11.49 g.
Potassium bromide—119 mg.
Water to 1 liter.

Re. 29,931

Patent Not Issued For This Number

Re. 29,932

CATALYTIC PURIFIER UNIT

Per G. Norback, Lidingo, Sweden, assignor to Aktiebolaget Carl Munters, Sollentuna, Sweden

Original No. 3,951,865, dated Apr. 20, 1976, Ser. No. 481,211, Jun. 20, 1974. Application for reissue Mar. 20, 1978, Ser. No. 890,865

Claims priority, application Sweden, Jun. 25, 1973, 7308909

Int. Cl.² B01J *35/04*

U.S. Cl. 252—454 **9 Claims**

1. In a catalytic purifier unit for purifying hot exhaust gases [from internal combustion engines] having a catalyst supporting skeletal body formed of layers, at least some of which are corrugated, bearing against one another and defining a large number of narrow passageways through which the exhaust gases pass, the improvement in the body resulting in a lightweight porous skeleton capable of rapid homogenous heat distribution and resistance to thermal stress and mechanical shock comprising layers of asbestos sheet containing fused material selected from the group consisting of metal silicate and ceramic metal oxide or combinations of the two formed by contacting the asbestos sheet with an inorganic material in a liquid state and obtaining a precipitate therefrom, the inorganic material being decomposable to yield the material selected from the group consisting of metal silicate and ceramic metal oxide, and then heating the contacted asbestos sheet to the fusing temperature for the precipitate.

Re. 29,933

DELAYED AND SUSTAINED UREA RELEASE COMPOSITIONS

Henry H. George, Jr., Berkeley Heights; Sol J. Barer, Clark, and Charles L. Smart, Millington, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Original No. 4,035,479, dated Jul. 12, 1977, Ser. No. 631,806, Nov. 14, 1975. Application for reissue Jan. 16, 1978, Ser. No. 869,472

Int. Cl.² A61K *31/74, 31/78, 31/17*

U.S. Cl. 424—78 **5 Claims**

1. In feed supplement rations for ruminants comprising an association product of a [minor] *major* proportion of urea and a [major] *minor* porportion of carboxy vinyl polymer, the improvement which consists of incorporating with said association product a minor effective proportion of an alpha olefin polymer, whereby urea release rates are extended.

Re. 29,934

DERIVATIVES OF 5-CARBAMOYLOXYMETHYL-3-SUBSTITUTED-2-OXAZOLIDINONES, PROCESS OF PREPARATION THEREOF AND THERAPEUTIC APPLICATION

Claude P. Fauran; Guy M. Raynaud, both of Paris; Rene A. Oliver, Vincennes, and Colette A. Douzon, Paris, all of France, assignors to Delalande S. A., Courbevoie, France

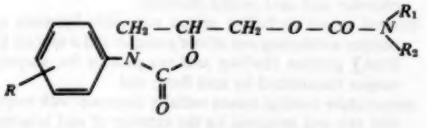
Original No. 3,641,036, dated Feb. 8, 1972, Ser. No. 20,401, Mar. 17, 1970. Application for reissue Mar. 3, 1976, Ser. No. 663,563

Claims priority, application United Kingdom, Mar. 18, 1969, 14260/69

Int. Cl.² C07D *263/24, 295/20*

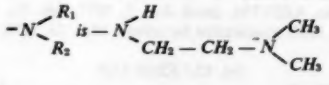
U.S. Cl. 544—369 **1 Claim**

3. A compound of the formula



in which (1)

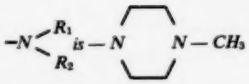
is —NH_2 and R is H, m-CF_3, o-CF_3, m-Cl, p-Cl, m-Br, m-F, p-F, o-F, p-CH_3 or m-CH_3, or



(2)

and R is H, m-CF_3 or m-F, or

(3)



and R is H, m-CF_3 or m-F, and the pharmaceutically acceptable acid addition salts thereof.

Re. 29,935

N-SUBSTITUTED IMIDAZOLES AND THEIR SALTS

Wilfried Draber; Karl H. Buchel, and Manfred Plempel, all of Wuppertal-Elberfeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

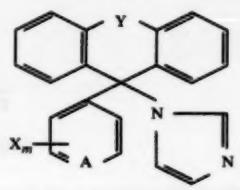
Original No. 3,647,816, dated Mar. 7, 1972, Ser. No. 876,033, Nov. 12, 1969. Application for reissue Jan. 27, 1978, Ser. No. 872,940

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1968, 1811654

Int. Cl.[2] **C07D** *233/62*

U.S. Cl. 548—345 **21 Claims**

1. An N-substituted imidazole of the formula:



in which

X is alkyl of 1 to 4 carbon atoms, mercaptoalkyl of 1 to 4 carbon atoms in the alkyl moiety, halogen, nitro, cyano or trifluoromethyl,

Y is $-(CH_2)_n-$ or $-CH=CH-$,

A is CH,

m is 0 or 1 and

n is 0, 1 or 2,

or a pharmaceutically acceptable salt thereof.

PLANT PATENTS

GRANTED MARCH 13, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,394

PLUM TREE

Chris F. Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351

Filed Oct. 3, 1977, Ser. No. 839,108

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct variety of plum tree, as illustrated and described, which is a regular and productive bearer of medium to large, firm, clingstone fruit, having yellow flesh and a red skin color; characterized, in comparison to the Red Beaut, (U.S. Plant Pat. No. 2,539); by fruit which ripens 2 to 3 days earlier, is of slightly larger in size, is clingstone instead of freestone, has yellow flesh color instead of red flesh color.

4,395

PEACH TREE

Chris F. Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351

Filed Dec. 20, 1977, Ser. No. 862,634

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree; as illustrated and described, characterized by its dwarf size, averaging 7 to 9 feet at maturity and further characterized by its productive and regular bearing of large size, yellow flesh, freestone fruit of good eating quality and the high degree of firmness of fruit when mature provides good shipping characteristics.

PATENTS

GRANTED MAR. 13, 1979

ERRATA

For CLASS	See PATENT NO.
417–366	4,143,488
405–145	4,143,519
073–358	4,143,617
401–028	4,143,667
414–787	4,143,773
414–745	4,143,774
414–330	4,143,775
414–735	4,143,776
414–170	4,143,777
414–694	4,143,778
414–411	4,143,779
414–420	4,143,780
414–460	4,143,781
414–672	4,143,782
414–715	4,143,783
249–135	4,143,852
526–048.2	4,143,858
528–231	4,144,226
526–040	4,144,227
546–046	4,144,236
546–318	4,144,238
546–301	4,144,239
542–418	4,144,258
568–645	4,144,276
364–107	4,144,550

PATENTS

GRANTED MARCH 13, 1979

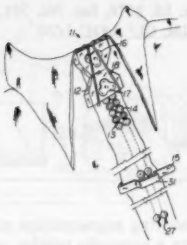
10Cl 41 A

PATENTS

GRANTED MARCH 13, 1979

GENERAL AND MECHANICAL

4,143,422
STRING TIE AND ORNAMENTAL FASTENING
Arland W. Wilson, R.R. 2, Davenport, Iowa 52804
Filed Aug. 12, 1977, Ser. No. 823,957
Int. Cl.[2] A41D *25/04*
U.S. Cl. 2—145 **5 Claims**



1. A necktie having an ornamental member and a string tie attached to said ornamental member,

said ornamental member to be fastened to the front of a collar of a garment, said ornamental member being fabricated of rigid material of moderate thickness,

a clasp attached to said ornamental member, said clasp having a fastening portion extending from the top of said ornamental member downwardly along the back of the upper portion of said ornamental member for gripping a collar between said upper portion of said ornamental member and said fastening portion,

said clasp being a wire of spring material having an end secured to the bottom edge of said ornamental member, said wire being bent at said end thereof and extending upwardly over the front of said ornament, and a portion of said wire that is opposite said end being bent over the top of said ornamental member to form said fastening portion.

4,143,423
SURGICAL LUBRICANTS
Jack J. Sternlieb, 73-382 Salt Cedar Ave., Palm Desert, Calif. 92260
Filed Oct. 25, 1977, Ser. No. 844,726
Int. Cl.[2] A41D *19/00*; A61F *13/00*; C10M *3/18, 1/10*
U.S. Cl. 2—168 **22 Claims**

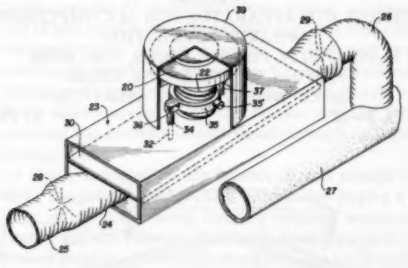
12. Plastic, natural or synthetic rubber surgical devices whose surfaces are coated with a dry layer of a chemical compound of one alkali metal selected from the group consisting of sodium (Na) and potassium (K) in chemical combination with a radical selected from the group consisting of carbonate (CO_3), bicarbonate (HCO_3), acetate ($C_2H_3O_2$), acetate trihydrate ($C_2H_3O_2.3H_2O$), and citrate dihydrate ($C_6H_5O_7.2H_2O$) as a nontoxic lubricating coating to ease installation and to prevent self-adhesion in storage.

4,143,424
COMBINED INTERLINING AND CHEST PIECE FOR GARMENTS
Jurgen Knoke; Gerhard Stegmann; Bohuslav Tecl, and Erich Fahrbach, all of Weinheim an der Bergstrasse, Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 865,083, Dec. 27, 1977, abandoned, which is a continuation of Ser. No. 738,988, Nov. 4, 1976, abandoned. This application Jun. 30, 1978, Ser. No. 921,156
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1975, 2520253
Int. Cl.[2] A41D *27/06*
U.S. Cl. 2—255 **11 Claims**

1. A process for producing an interlining-chest piece combination comprising placing on the inside face of an outer fabric the first face of a first non-woven fabric having first and second faces, said first non-woven fabric havig been formed by subjecting a partially pre-fixed fabric to an additional partial bonding with a resilient bonding agent and said first face having been printed with a fusible adhesive, hot pressing the combination of outer fabric and first non-woven fabric to effect joinder through the fusible adhesive, cutting and sewing the combination to form a three-dimensional structure, placing on the second face of the first non-woven fabric the first face of a second non-woven fabric having first and second faces, said second non-woven fabric having been formed by subjecting a partially pre-fixed fabric to an additional partial bonding with a resilient bonding agent and said first face thereof having been printed with a fusible adhesive, and hot pressing the combination of outer fabric and first and second nonwoven fabrics to join all three through the fusible adhesives, the three-layer combination upon dry cleaning being shape retaining and resistant to delamination.

10. An interlining-chest piece combination produced by the process of claim 1.

4,143,425
LEFT ATRIAL TO DESCENDING THORACIC AORTA LEFT VENTRICULAR ASSIST DEVICE
Thomas M. Runge, 2501 Galewood Pl., Austin, Tex. 78703
Filed Oct. 27, 1977, Ser. No. 846,109
Int. Cl.[2] A61F *1/24*; A61M *1/03*
U.S. Cl. 3—1.7 **10 Claims**



1. A cardiac assist device comprising a substantially rigid compression chamber having opposite end openings, a compressible pouch extending longitudinally through said compression chamber and adapted for connection outside of said chamber with cardiac circulatory elements, check valve means in opposite end portions of said pouch, an ejection plate in said compression chamber on one side of the pouch, and a power drive means connected with said ejection plate including a pair

of drive elements spaced longitudinally on the ejection plate and pivoted thereto, and means forming a yielding connection in the power drive means with one of said drive elements whereby in the operation of the device the pouch is compressed by the ejection plate first at one end portion of the pouch and subsequently at the opposite end portion so that predetermined volumes of blood are expelled cyclically from the pouch at its end which is compressed last by the ejection plate.

4,143,426

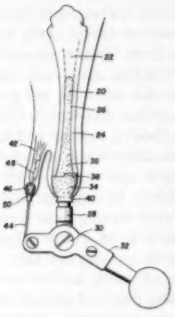
PERMANENTLY ATTACHED ARTIFICIAL LIMB

C. William Hall, Boerne; William A. Mallow, and Fred O. Hoese, both of San Antonio, all of Tex., assignors to The United States of America as represented by the Administrator of Veterans Affairs, Washington, D.C.

Filed Mar. 30, 1977, Ser. No. 782,849

Int. Cl.[2] A61F *1/08, 1/24*

U.S. Cl. 3—6 **18 Claims**



9. An artificial limb adapted to become permanently attached, comprising:

an endoprosthesis with an external articulating joint; and

an artificial tendon adapted to connect said external articulating joint to a skeletal muscle with said tendon passing through the skin, said artificial tendon comprising skin interfacing means to provide a tissue ingrowth surface of large surface area at the skin interface, and tissue interfacing means for musculotendenous attachment including a large surface area wrappable about the end of a skeletal muscle or tendon to form a large interface.

4,143,427

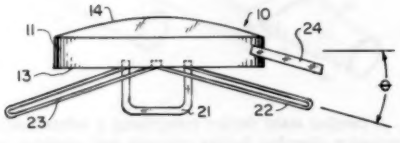
METHOD AND APPARATUS FOR ACCOMPLISHING APHAKIC CORRECTION

Aziz Y. Anis, 7531 N. Hampton, Lincoln, Nebr. 68506

Filed Jun. 10, 1977, Ser. No. 805,265

Int. Cl.[2] A61F *1/16, 9/00;* A61B *17/28*

U.S. Cl. 3—13 **11 Claims**



6. A micro staple for use in aphakic correction comprising:

an elongate member of a biologically inert material, said elongate member formed into a symmetrical open-sided polygon having a base connected to two substantially identical in length diverging arms which terminate, respectively, in two converging legs, said legs being of substantially equal length and equal to approximately one-half the length of said base, and when said member is closed with the ends of said legs pressed together in a mating connection the outer surfaces of said legs are in longitudinal alignment.

4,143,428

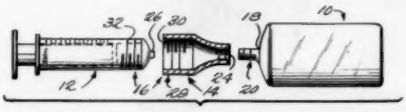
SALINE FILL OF SILICONE PROSTHESIS DURING MAMMAPLASTY AUGMENTATION

I. Kelman Cohen, 5104 Cary St. Rd., Richmond, Va. 23226

Filed Dec. 16, 1976, Ser. No. 751,215

Int. Cl.[2] A41C *3/10*

U.S. Cl. 3—36 **4 Claims**



1. A method of practicing augmentation mammaplasty utilizing a syringe having a generally tubular connector releasably connected thereto, the connector having a first end screw-threaded for engagement with a screw-threaded liquid containing bottle neck, comprising the steps of:

implanting an inflatable prosthesis in a breast, and sequentially

sterilly filling the syringe with a sufficient volume of liquid to completely fill the inflatable prosthesis by bringing the first end of the tubular connector into engagement with the liquid containing bottle neck, filling the syringe with liquid by expanding the volume of the syringe, and releasing connection between the syringe and the tubular connector;

connecting up the syringe to the prosthesis; and

completely filling the prosthesis with liquid from the syringe without detachment of the syringe from connection with the prosthesis.

4,143,429

VANITY AND LAVATORY ASSEMBLY

Merritt W. Seymour, Sylvania, and James E. Jones, Toledo, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 618,586, Oct. 1, 1975, abandoned. This application Feb. 27, 1978, Ser. No. 881,209

Int. Cl.[2] E03C *1/322, 1/33;* A47K *1/04*

U.S. Cl. 4—170 **7 Claims**

1. A vanity and lavatory assembly adapted to be secured to two opposing walls of a room comprising:

a vanity member having a lavatory located at a first surface and a support portion and an attachment portion oriented substantially transverse to said first surface and spaced from said first surface at each lateral end of said vanity member, said support portions each having a lower surface with a raised portion located thereon;

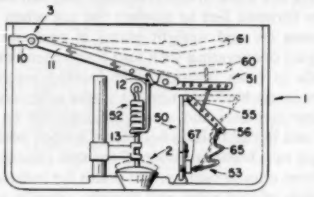
a pair of mounting brackets each adapted to be secured individually to one of the opposing walls, each of said brackets having an upper leg and a lower leg projecting from the surface of the bracket in a direction normal to the surface of the opposed walls and adapted to accomodate the vanity member therebetween and each mounting bracket further including an attachment surface, each of said lower legs having a raised ramp thereon, the raised portion at each end of the vanity member and said ramps of the brackets being adapted to position the vanity member in pressed relationship against said upper legs of each of said brackets, said attachment portions of the vanity member and said attachment surfaces being oriented for individual engagement to locate the vanity member with respect to the brackets; and

means for securing the attachment portion to the attachment surface.

4,143,430
VALVED VOLUME DIVIDING MEANS

Devendra C. Joshi, 1066 Oak St., Neenah, Wis. 54956, and Virendra Sharma, 1400 Linda Ave., Menasha, Wis. 54952

Filed Jul. 18, 1977, Ser. No. 816,900
Int. Cl.[2] E03D *1/14*
U.S. Cl. 4—324 8 Claims



1. A water closet tank discharge regulating means comprising:

(a) a compartmentalizing unit whereby the tank is divided into water retaining compartments; a first compartment and a second compartment,

(b) a port in the compartmentalizing unit through which water may pass between the first compartment and the second compartment,

(c) a valve which serves to seal and open the port,

(d) an actuator linking unit by means of which the valve is operably connected to an existing flush arm of the tank.

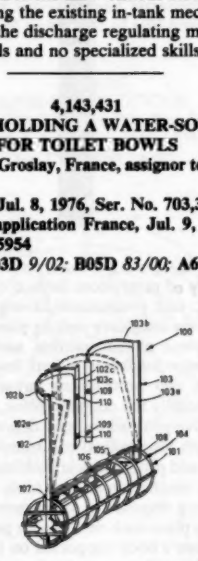
(e) an adjustment means which is employable to set the degree of rotation of the flush arm needed for a valve opening, and

(f) means for providing that the compartmentalizing unit, the actuator linkage unit, and the adjustment means are directly installable in the tank without modifying or significantly disturbing the existing in-tank mechanisms and the installation of the discharge regulating means requires no specialized tools and no specialized skills.

4,143,431
SUPPORT FOR HOLDING A WATER-SOLUBLE STICK FOR TOILET BOWLS

Antonin Goncalves, Groslay, France, assignor to L' Oreal, Paris, France

Filed Jul. 8, 1976, Ser. No. 703,361
Claims priority, application France, Jul. 9, 1975, 75 21570; Nov. 25, 1975, 75 35954
Int. Cl.[2] E03D *9/02*; B05D *83/00*; A61L *3/00*
U.S. Cl. 4—231 12 Claims

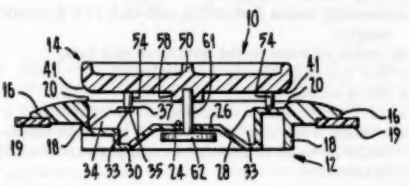


1. Support comprising a perforated basket forming a receptacle to contain a block of a hydrosoluble product for the disinfection and deodorization of toilet bowls, said basket comprising two substantially identical parts in the form of concave members pivotable to a closed position in contact with each other at their peripheral edge, one concave member pivoting with respect to the other concave member along an axis parallel to the axis of the basket by means of at least one integral connector formed by moulding with said concave members, said connector integrally uniting the two concave members at one of their longitudinal edges, fastener means for fastening the two concave members together at their other longitudinal edge to maintain the basket closed, at least one U shaped suspension hook fixed to the basket by a web hinge formed by moulding with said basket, a central branch of the U of the hook being elastically deformable and extensible and having a curved profile longitudinally so that said hook can elastically grip toilet bowl rims of different thickness, said at least one hook pivoting transversely with respect to the axis of said basket by means of said web hinge so that the branch of the U of the hook which is connected to the basket can swing to a position against and conforming to the lateral longitudinal surface of the basket after pivoting the concave members together to close the basket.

4,143,432
ADJUSTABLE DRAIN PLUG

Frederick J. Deken, 19 Ruskin Rd., Glen Iris, Victoria, Australia (3146)

Filed May 25, 1977, Ser. No. 800,226
Claims priority, application Australia, May 21, 1976, 6026/76
Int. Cl.[2] A47K *1/14*; E03C *1/23*
U.S. Cl. 4—295 7 Claims



1. A plug for a drain outlet of a vessel, said plug comprising:

a generally tubular body formed for removable insertion in said outlet, said body having sealing means on the exterior adapted to engage at least one of said drain or vessel to provide a water-tight seal therewith, said body having a drain passage through the central interior thereof;

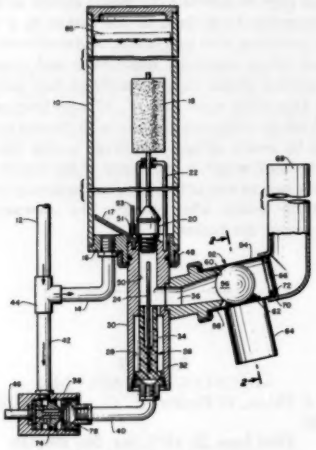
a closure member for said tubular body located on the upper end of said tubular body and axially movable with respect thereto between a lower position in which said closure member abuts said tubular member for sealing said central passage and an upper position in which said closure member is axially spaced from said tubular member for discharging the contents of said vessel through said central passage; and

ramp means mounted on the interior of said tubular body along the central passage, said ramp means having a plurality of upwardly facing ramping surfaces, means interconnecting said ramping surfaces to form a guide for said closure member and to form drain passages for permitting fluid flow between said ramping surfaces when said closure member is moved to its upper position, depending from the closure member and ramp follower means lower surface for contacting said ramping surfaces to provide axial movement to said closure member upon rotating of said closure member from a first rotary position to a second, angularly displaced, rotary position; said ramping surfaces including portions retaining said closure member in the upper position.

4,143,433
WATER CLOSET

E. Chris Skousgaard, 314 N. Emerald Dr., Lake Arrowhead, Calif. 92352

Filed Mar. 17, 1978, Ser. No. 888,048
Int. Cl.[2] E03D 3/10, 3/12
U.S. Cl. 4—354 14 Claims

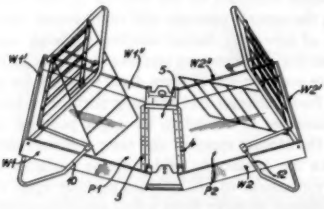


1. A hydraulic flushing device comprising:
a tank having a closed upper end;
closing means closing the bottom end;
connecting means connecting said tank to a domestic water supply;
an outlet adjacent to the bottom of said tank;
a float normally closing said outlet;
a piston mounted below said outlet;
a valve connected to the domestic water supply;
a conduit from said valve to said piston to supply water under pressure to one side of said piston when said valve is activated;
dislodging means on said piston for dislodging said float when water is supplied to said piston; and
said piston adapted to close said outlet before said float is dislodged whereby water from said tank forces said piston back to its original position during the flushing operation to open said outlet.

4,143,434
FOLDING COT

Christian Monot, Dijon, France, assignor to Societe Nouvelle Youpa-La, France

Filed Dec. 13, 1977, Ser. No. 860,112
Claims priority, application Japan, Dec. 15, 1976, 51-151428
Int. Cl.[2] A47C 29/00
U.S. Cl. 5—99 R 3 Claims



1. A foldable cot comprising two substantially identical half-shells each including a rectangular panel and a wall protruding substantially perpendicularly from one face of said panel around three edges thereof leaving a fourth edge free, a rectangular central part disposed between said half-shells and having longer opposite side edges and upright plates at shorter end edges thereof, means hingedly connecting said free edges of said panels of said half-shells respectively to said opposite side edges of said central part for movement of said half-shells between a closed position in which said half-shells and central part form a valise and an open position in which said panels lie in the plane of said central part, foldable frame members carried by said half-shells, said frame members being retractable into said valise when in closed position and forming sides and ends of the cot when in open position, said half-shells including members forming feet to support the cot when in open position, means on said upright plates at opposite ends of said central part cooperating with said frame members to lock said half-shells in open position, said locking means comprising channels on each of said upright plates to receive portions of said frame members and a cam rotatable on an inner face of each of said upright plates between a locked position in which it engages said frame members from said channels, and means visible from outside said upright plates for indicating the angular position of said cams and thereby visually indicating at a distance from outside the cot whether said cams are in locked position or in unlocked position.

4,143,435
MATTRESS HAVING A CORRUGATED PLATE

Isamu Masuda, Daimyo 1-chome 9-20, Chuo-ku, Fukuoka-shi, Fukuoka, Japan

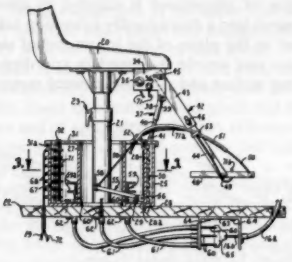
Filed Aug. 3, 1977, Ser. No. 821,434
Int. Cl.[2] A47C 27/08
U.S. Cl. 5—345 R 6 Claims

1. A mattress comprising a mattress body of foam rubber having a plurality of protrusions formed on at least the upper surfaces thereof, said protrusions having generally circular cross-sections along imaginary cutting planes disposed parallel to the general plane of the mattress, said protrusions being generally uniformly distributed in both longitudinal and transverse directions, said protrustions having terminating ends disposed in a generally flat common plane, depressions formed between successive protrusions, said depressions being evenly distributed in both longitudinal and transverse directions and alternating with said protrusions in both longitudinal and transverse directions, magnets in at least some of said depressions, said magnets being disposed in said depresssions spaced from said flat common plane such that a gap is provided between the magnets and a user's body supported on the upper surface of the mattress body, said magnets having a flux density of from 500 to 600 gauss, a hard corrugated board means disposed in the mattress between the upper and lower surfaces thereof, said corrugated board means extending over substantially the same area as that of the mattress body, and a covering sheet enclosing the mattress.

4,143,436
DIRECTIONAL CONTROL MECHANISM FOR A TROLLING MOTOR

Roy E. Jones, 548 Powahatan, Independence, Mo. 64056

Filed Mar. 4, 1977, Ser. No. 774,391
Int. Cl.[2] B63B *29/00*; B63H *21/26*
U.S. Cl. 9—7 12 Claims



12. A directional control mechanism for a boat having a seat assembly supported to rotate about a generally vertical axis and an outboard propulsion unit mounted to pivot in a manner to vary the direction of travel of the boat, said mechanism comprising:

a pedal carried on said seat assembly for rotation therewith and mounted to pivot about a generally horizontal axis;

a rotatable member coupled rigidly with said seat assembly for rotation directly therewith about said vertical axis;

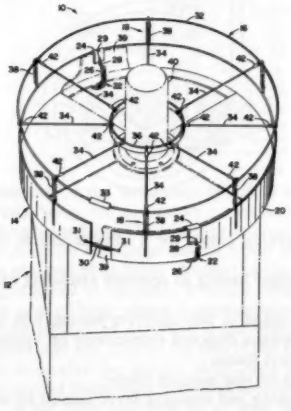
a control wire extending from said pedal and supported to extend and retract in response to pivotal movement of the pedal, said control wire having an end connected with said rotatable member, whereby the entirety of said wire rotates with said seat assembly and rotatable member, said wire maintaining a fixed relationship with said seat assembly and rotatable member during rotation of the seat assembly; and

means translating extension and retraction of said control wire into pivotal movement of said propulsion unit.

4,143,437
ANTI-ROOST DEVICE

Andrew N. Voykin, 311 Kenmore Rd., Brandon, Fla. 33511

Filed Oct. 3, 1977, Ser. No. 838,817
Int. Cl.[2] B63B *21/52*
U.S. Cl. 9—8 R 6 Claims

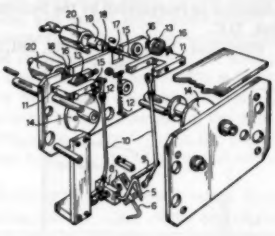


1. An anti-roost device for use in combination with sea buoys and the like comprising a base including securing means formed thereon to attach said anti-roost device to the sea buoy, an anti-roost means comprising an outer anti-roost member and interconnecting support means comprising a plurality of vertically disposed interconnecting elements coupling said outer anti-roost member in spaced relation above said base, said anti-roost means further including a plurality of inner anti-roost elements comprising loose strands extending inwardly from said outer anti-roost member, said inner anti-roost elements coupled at substantially the center thereof to a mounting ring, said mounting ring being substantially concentric with said base and said anti-roost member.

4,143,438
OPENER FOR OPENING SIGNATURES HAVING AN OVERLAP

Gianattilio Meratti, Torre de' Roveri (Bergamo), Italy

Filed Nov. 18, 1977, Ser. No. 852,642
Claims priority, application Italy, Jan. 20, 1977, 67116 A/77
Int. Cl.[2] B42C *19/00*
U.S. Cl. 11—1 R 6 Claims



1. A signature opener for opening signatures having an overlap, the opener having a conveyor, a rotatably-mounted opening member and a drive therefor, for engaging the overlap and pushing the part of the signature having the overlap away from the other part, thereby opening or initiating the opening of the signature, characterized in that there are two opening members (5 and 6) rotatably mounted about the same axis (7), the opening members and the respective drives (10, 11, 13 and 14) being arranged such that the opening members operate in opposite directions, and in that the opener includes control means (20) for energizing one of the opening members at a time, so that signatures (2) having overlaps (21) can be opened whichever way up the signatures are.

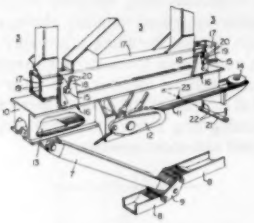
4,143,439
BRIDGE REINFORCEMENTS

James P. Fitzgerald-Smith, Ossemsley, near New Milton, and Derek I. Knight, Bournemouth, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Feb. 22, 1978, Ser. No. 879,996
Int. Cl.[2] E01D *9/00*
U.S. Cl. 14—10 9 Claims

1. A bridge reinforcement for a bridge span, said reinforcement comprising a reinforcing member attachable to said bridge span at two longitudinally spaced locations, at least one slideway attachable to said bridge span at a location intermediate said spaced locations and disposable in a direction parallel with the longitudinal axis of said bridge span, a slider block slidable upon said slideway, a reinforcing strut having a first end adapted for pivotal connection to said slider block and a second end adapted for pivotal connection to said reinforcing

member, and jacking means arranged to vary the position of said slider block with respect to said slideway, whereby in use,



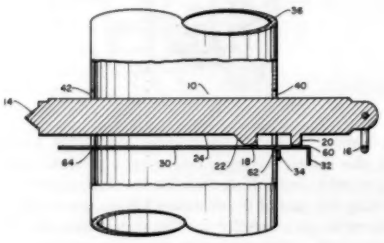
tension is adjustable in said reinforcing member via said reinforcing strut.

4,143,440

PIN CONNECTION SYSTEM FOR ELEVATED CAUSEWAYS

Clifford I. Skaalen, Oxnard, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 30, 1978, Ser. No. 891,772
Int. Cl.[2] E01D *19/02*
U.S. Cl. 14—77 **9 Claims**



9. A method for providing support to elevated causeway section from pipe pilings comprising:

a. providing a pair of diametrically-opposed openings in said pipe piling;

b. inserting a flat, elongated skid plate through said openings such that said skid plate projects outward from said pipe piling from each said opening;

c. inserting a pin through said pair of openings such that said pin projects outward from said pipe piling from each said opening, said pin slidably riding upon said skid plate during insertion;

d. removing said skid plate from said pipe piling openings; and

e. lowering said causeway section upon said inserted pin.

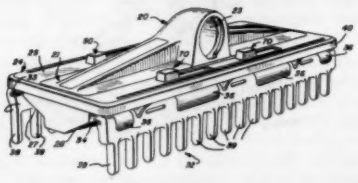
4,143,441

VACUUM CLEANER NOZZLE

Joseph F. Brooks, Bloomington; Samuel E. Hohulin, Lexington, and Scott N. Lockhart, Normal, all of Ill., assignors to National Union Electric Corporation, Greenwich, Conn.

Filed Jan. 10, 1977, Ser. No. 757,985
Int. Cl.[2] A47L *9/06*
U.S. Cl. 15—369 **8 Claims**

1. In a vacuum cleaner nozzle which has a suction housing section with an air passage extending therethrough adapted to be connected with suction means of a vacuum cleaner, a sole plate member having a generally rectangular main body section which encloses the lower end of said housing section, said sole plate member having an elongated longitudinally extending air intake opening defined by an aperture in a lower wall section of said body section and communicating with said air passage of said vacuum cleaner nozzle suction housing, a rake member pivotally mounted on said main body section of the sole plate member adjacent a longitudinal edge of said sole plate member and said rake member having spaced depending teeth adapted for raking a shag-type rug, rake control means associated with said sole plate and said rake member which in a first position of adjustment is adapted to allow said rake member to move into a downwardly extending raking position perpendicular to the plane of the lower end of said air intake opening when said nozzle is moved in one direction over a supporting rug surface and said rake control means in a second



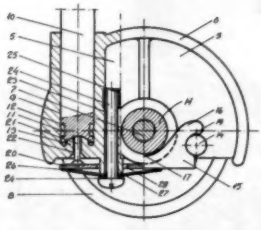
position of adjustment adapted to hold said rake member in a retracted position with the said teeth disposed adjacent said lower wall section of the sole plate and with the lower ends of said teeth lying in a horizontal plane which is no lower than the plane of the lower end of said air intake opening, and said rake control means having a reciprocable cam member mounted on said sole plate adapted to slidably engage in a cam track formed in the upper end of said rake member and effect pivotal movement of said rake member from said raking position into said retracted position and hold said rake in said retracted position when said cam member is moved from said first position of adjustment into said second position of adjustment thereof.

4,143,442

CASTOR WITH A BRAKE DEVICE

Bent Harlang, Klampenborg, Denmark, assignor to Kevi A/S, Glostrup, Denmark

Filed Oct. 14, 1977, Ser. No. 842,144
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1976, 4730/76
Int. Cl.[2] B60B *33/00*
U.S. Cl. 16—35 R **5 Claims**



1. A self-braking castor for a rollable article of furniture comprising:

a support frame having an aperture extending axially therethrough;

an axle mounted in said aperture having first and second wheels thereon disposed respectively on opposed sides of said support frame;

pivot means on said support frame;

a wheel braking and retaining lever carried by said support frame to be pivotable at one end thereof about said pivot means, said lever having an intermediate portion configured and dimensioned to be engageable with said wheels

when pivoted into a first pivotable position to effect braking of the wheels and to be free of said wheels to permit rotation thereof when pivoted into a second pivotable position, said lever in both of said first and second pivotable positions being cooperable with said wheels to retain same on said axle;

a pivot rod member carried by said support frame for reciprocation in a substantially vertical plane, said pivot rod member being engageable at its upper extremity by the article of furniture and operatively engageable at its lower extremity with the other end of said lever;

a bore formed in said support frame and a pin member positioned reciprocally within said bore and interposed between the lower extremity of said pivot rod member and said other end of said lever to thereby effectuate operative engagement of said pivot rod member and said other end of said lever;

and spring means carried by said support frame biasing said other end of said lever and thereby through the interposition of the pin member said pivot rod member upwardly, the spring force of said spring means being pre-set such that when a load below a predetermined value is transmitted from the article of furniture to the upper extremity of said rod member said lever is spring-biased into said first pivotable position and the wheels are braked whereas when the load transmitted from the article of furniture to the upper extremity of said pivot rod member exceeds said predetermined value the force of said spring means is overcome and said pivot rod member urges said lever into said second pivotable position to thereby remove the braking force from the wheels.

4,143,443

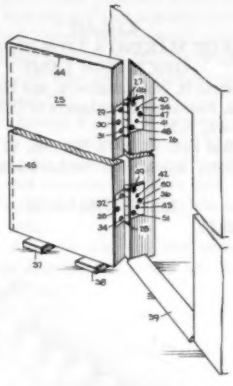
PILOT HOLE DOOR MOUNTING APPARATUS

John S. Reyle, 343 Van Deunda Ave., Teaneck, N.J. 07666

Filed Sep. 1, 1977, Ser. No. 829,776

Int. Cl.[2] E05D *9/00, 11/00;* **E05B** *17/06*

U.S. Cl. 16—128 R **8 Claims**



1. In apparatus for the installation of a door at an opening, said apparatus being for accurately sizing and hanging the door, the door being hinged to a jamb at an opening by at least one double mortised butt hinge having a pair of hinge plates joined by a pin, one plate being attached to the door and the other being attached to the jamb, in which installation, a first plate of the pair of hinge plates is permanently secured at a predetermined location in a mortise at the edge of one of the door and jamb, and the other of the one of the door and jamb is mortised to receive the second hinge plate in the mortise formed, the second hinge plate to be held securely to the other of the one of the door and jamb by at least one screw, the location of the second hinge plate in the other of the one of the door and jamb corresponding to the predetermined location at which the first hinge plate is permanently secured to the one of the door and jamb, and during which installation the door is sized, the mortise for the second hinge plate is located and cut, and the location of the hole to receive the at least one screw which secures the second hinge plate is identified, the improvement consisting of the pilot hole hinge and brad which includes:

a pair of joinable substantially solid, flat, rectangular, butt hinge plates, each having at least one extending sleeve complimentary with the other, said sleeve being adapted to receive a pin which joins the plates and about which the plates rotate,

a pin adapted to join the hinge plates through the extending complimentary sleeves,

the first hinge plate adapted to be permanently secured at a predetermined location in a mortise to one of the door and jamb, the second plate of the pair having at least one screw hole adapted to receive a screw to affix said plate permanently to the other of the one of the door and jamb in the mortise which is to be cut to the size of the second plate to receive the plate therein,

the second plate also including a pair of small pilot holes, the pilot holes being of relatively smaller diameter than the screw hole and being further adapted to accommodate a pilot brad, the pilot holes being further located at points along a linear axis in the hinge plate which linear pilot hole axis is separate from any other axis line parallel to the edges of the rectangular hinge plate on which other axis line any of the at least one screw hole is located,

a pair of pilot brads, each pilot brad having a head of a diameter greater than the diameter of the pilot hole and a shaft adapted to be driven through the pilot hole of the second hinge plate into the other of the one of the door and jamb,

the pilot brads being further adapted, when driven through the pilot holes into the other of the one of the door and jamb, temporarily to affix the second hinge plate to the other one of the door and jamb at a location thereon corresponding to the location of the hinge plate permanently affixed to the one of the door and jamb, at the opening where the door is to be installed,

the second hinge plate so temporarily affixed being adapted to allow the opening to be a template for itself for accurately sizing the door and the second hinge plate to be a template for itself both for accurately locating the mortise for the second plate and for accurately locating the at least one screw hole which receives the at least one screw which permanently secures the second plate to the other of the one of the door and jamb in the mortise to be cut which is to receive the second plate,

the pilot brads being further adapted to be easily removed from the other of the one of the door and jamb, after the door is sized with respect to the opening and the mortise and screw holes for the second hinge plate are accurately sized and located.

4,143,444

OYSTER PROCESSING APPARATUS

James P. Cox, Lynden, Wash., assignor to KC Enterprises, Seattle, Wash.

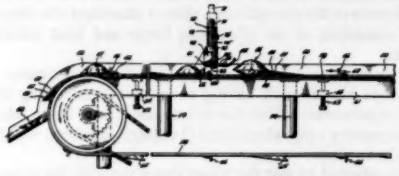
Filed Mar. 1, 1977, Ser. No. 773,187

Int. Cl.[2] A22C *29/04*

U.S. Cl. 17—74 **19 Claims**

1. Apparatus for opening an oyster comprising a reaction member for engaging one half shell of the oyster, a hold-down member spaced from the reaction member for engaging the other half shell of the oyster, a concussion barrier having force-applying means for engaging an edge portion of one of the half shells of the oyster generally between said two members, flight means located generally at the side of the oyster oppposite the concussion barrier edgewise of the oyster and having force-applying means for engaging an edge portion of the other half shell of the oyster between said two members, and power drive means for moving said flight means relatively

toward said concussion barrier for applying to the oyster between said two force-applying means an abrupt shearing jolt in



a direction generally parallel to the joint between the oyster half shells to slide the half shells relative to each other for moving their mutually interfitting margins out of registration.

4,143,445

FIXATION DEVICE

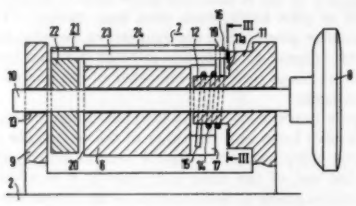
Arthur Fougman, Sollentuna, Sweden, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 17, 1978, Ser. No. 887,475

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1977, 2714695

Int. Cl.[2] A44B *21/00*

U.S. Cl. 24—68 R **3 Claims**



1. A fixation device for a patient, including a fixation strap, a rotatable roll for fastening one end of the strap, a shaft mounting the rotatable roll for rotation, holding means for rotatably mounting the shaft, a handle fastened to the shaft, and a manually releasable blocking arrangement for blocking the roll in the direction of release of strap tension, characterized by the fact that the roll (6) is freely rotatably on the shaft (10), that the holding means (9) has a stationary generally cylindrical stop means (12), that the blocking arrangement comprises a spring (14) firmly coiled about the cylindrical stop means (12), the free ends (15, 16) of said spring protruding, at least one control stop (17) of the roll (6) coacting with one spring end (15) so that, as the strap (5) is pulled off the roll (6) the control stop (17) acts against said spring end (15) and keeps the spring (14) taut, and an entrainment means (21) fastened to the shaft (10) and arranged between both spring ends (15, 16), and operable upon rotation of the shaft (10) in either of its directions of rotation to act on the spring ends (15, 16) so that the spring (14) is released from the cylindrical stop means (12).

4,143,446

ROPE OR CABLE CLAMP DEVICE

Dennis L. R. Down, Elwell, Diptford, Totnes, Devon, England

Filed May 26, 1977, Ser. No. 800,708

Int. Cl.[2] F16G *11/00*

U.S. Cl. 24—115 R **4 Claims**

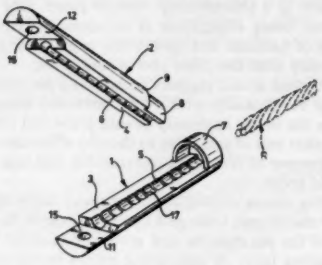
1. A clamp device for gripping a cable or rope comprising:

two completely separable elongate jaws having therein longitudinally extending channels of substantially semi-circular cross-section;

interlocking portions at one end of said jaws for interlocking the jaws at said end for angular movement relative to each other about a transverse axis at said one end, and

releasable screw clamp means engaging the ends of the jaws opposite the said interlocking portions for holding the jaws together in a closed gripping position in which the channels in the jaws register with each other to define a cavity for receiving a cable or rope to be gripped;

a plurality of ribs in each jaw extending transversely across the respective channel in the jaw, the ribs in the two jaws



being spaced apart longitudinally along the respective channels and being disposed in different respective longitudinal positions so that the cavity defined by the channels when the jaws are closed has a sinuous shape, causing a rope or cable to adopt an undulatory shape when clamped in the cavity with the jaws closed.

4,143,447

METHOD OF MAKING A LOW-PRESSURE GAS DISCHARGE LAMP

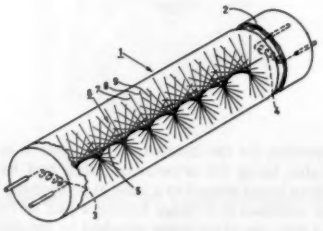
Jan Hasker; Petrus R. van Ijzendoorn, and Hendrik Roelofs, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 13, 1978, Ser. No. 877,162

Claims priority, application Netherlands, Feb. 23, 1977, 7701910

Int. Cl.[2] H01J *9/00*

U.S. Cl. 29—25.13 **8 Claims**

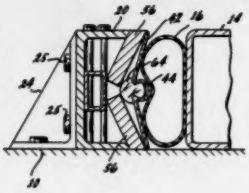


1. A method of manufacturing a low-pressure gas discharge lamp which comprises: providing a discharge vessel, providing a shaped wire support, providing a plurality of fibres, forming a body having a thinly distributed structure by connecting said support to a plurality of said fibres in substantially perpendicularly relationship to said support, twisting said support so that said fibres extend in spatially distributed direction and introducing said body into said discharge vessel.

4,143,448
METHOD AND APPARATUS FOR MANUFACTURING SOLAR HEATER PANELS

Terrence R. Caster, and Laurance W. Burry, both of San Diego, Calif., assignors to Energy Systems, Inc., San Diego, Calif.

Filed Nov. 18, 1977, Ser. No. 852,689
Int. Cl.[2] B23P *15/26, 19/04*
U.S. Cl. 29—157.3 C 6 Claims



1. Apparatus for assembling solar heater panels, which comprises:

an elongated upstanding wall secured to a table top;

an elongated inflatable tube secured to at least one side of said wall substantially parallel to said table top;

an elongated fixture secured to said table top adjacent to said tube;

said fixture comprising a channel member having two legs and an intermediate base in a generally U-shaped configuration, said channel member positioned with one leg secured to said top and the open side of said channel toward said tube, an elongated spacer member secured to the inside base of said channel substantially along the channel centerline, said spacer having a thickness less than the height of said legs, and a pair of die bars secured to the free edges of said legs and to said spacer bar with a uniform narrow gap between said bars at said spacer, whereby a concave shallow V-shaped face is presented to said tube with a narrow slot along the centerline of said face;

an elongated bar having a plate at one end substantially perpendicular to the centerline of said bar and an outwardly extending tab on said bar, said bar adapted to be inserted along said concave face with said tab extending into said narrow slot and said place in contact with the end of said fixture; and,

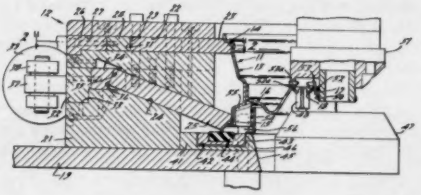
means to inflate said tube whereby said tube presses any object placed between said tube and said fixture against said face of said fixture.

4,143,449
WHEEL FORMING MACHINE

John A. Main, Plymouth, and David Trevarrow, Horton, both of Mich., assignors to Kelsey-Hayes Co., Romulus, Mich.

Filed Sep. 16, 1977, Ser. No. 833,889
Int. Cl.[2] B21D *53/26*
U.S. Cl. 29—159.1 12 Claims

1. The method of accurately forming an assembled wheel having a rim defining a tire engaging bead seat and a wheel center comprising the steps of assembling the rim to the wheel

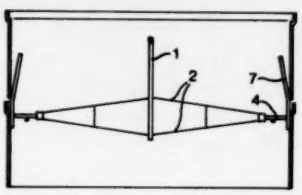


center and deflecting the bead seat of the assembled wheel into an accurate axial location relative to the wheel center.

4,143,450
APPARATUS FOR CENTERING AND JOINING CYLINDRICAL WOUND SECTIONS

Peter H. Selden; Wolfgang Albrecht, both of Ludwigshafen, and Heinz Weissenmayer, Boehl-Iggelheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 11, 1978, Ser. No. 868,534
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1977, 7702651[U]
Int. Cl.[2] B25B *27/14*
U.S. Cl. 29—272 2 Claims



1. Apparatus for centering and joining cylindrical wound sections, which are not dimensionally stable, of fiber-reinforced plastics, said apparatus comprising a central tube, a profile ring and a plurality of struts which join said central tube to said profile ring, and wherein there are provided, on the periphery of said profile ring, levers joined to one another by rods, said levers carrying guide rails at their free ends and being detachably fastened to said profile ring by means of swivel joints.

4,143,451
METHOD OF MANUFACTURING A FLEXURE HINGE ASSEMBLY

Robert J. G. Craig, Malibu; Clifton T. Council, Woodland Hills, and Jack F. Jansen, Thousand Oaks, all of Calif., assignors to Litton Systems, Inc., Woodland Hills, Calif.

Filed Apr. 5, 1976, Ser. No. 673,605
Int. Cl.[2] B23P *9/00, 17/00;* G01C *19/22*
U.S. Cl. 29—434 15 Claims

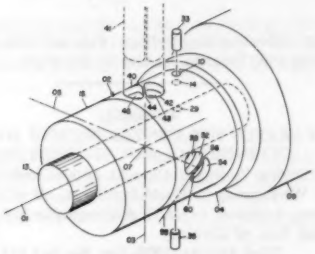
1. A method of fabricating a flexure hinge assembly comprising the steps of:

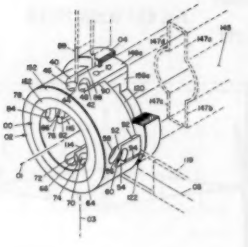
temporarily and releasably securing a pair of tubular members in a coaxially concentric aligned first relative angular position one within the other;

forming four pairs of circumferentially adjacent apertures equiangularly spaced around the circumference of the outer tubular member of said pair of tubular members to create four flexure blades in the wall of the outer tubular member and four pairs of circumferentially adjacent apertures equiangularly spaced around the circumference of

the inner tubular member to create four flexure blades in the wall of the inner tubular member of said pair of tubular members, the wall of each aperture of the inner tubular member forming a flexure blade being substantially coplanar with the wall of a generally radially adjacent wall of an aperture in the outer tubular member forming another flexure blade;

rotating said tubular members through a predetermined first angle to a second coaxial relative angular position with respect to one another to create four equiangularly spaced flexure hinges each having a pair of flexure blades with





substantially orthogonal axes of symmetry and a common, colineal flexure axis;

securing said tubular members to one another in said second position; and

forming a plurality of slots in the walls of said inner and outer tubular members to divide said inner and outer tubular members into a driving element, at least one gimbal element and a driven element, at least a pair of flexure blades flexibly connecting said gimbal element to said driving element and at least a pair of flexure blades flexibly connecting said gimbal element to said driven element.

4,143,452

PACIFIER METHOD OF CONSTRUCTION

Louise Z. Hakim, 126 Sabine, Monroe, La. 71201

Filed Feb. 8, 1978, Ser. No. 876,288

Int. Cl.[2] B23P *19/00;* **B29C** *19/00;* **B32B** *31/00*

U.S. Cl. 29—434 **10 Claims**

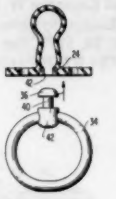
1. A method of making a pacifier having a hollow nipple, a shield and a handle as a unitary item comprising the steps of:

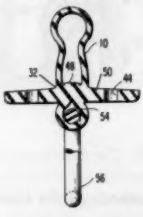
placing a premolded latex-type nipple on a central post component of a mold for the shield such that an opening will remain into said nipple after molding;

pouring a latex-type material into said mold to integrally-mold said nipple and shield together;

removing said nipple and shield from said mold before the latex-type material has cured; and

placing a quantity of latex-type material on a component portion of said handle and inserting said component portion into the hole, whereby, upon curing of said latex





material, said nipple, shield and handle are molded as a unitary item inseparable in actual use.

4,143,453

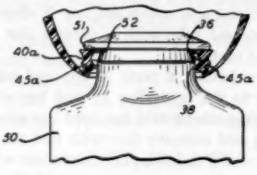
APPENDAGE SUCH AS A DOLL'S HEAD, A METHOD FOR BLOW MOLDING SAME OF ELASTOMER MATERIAL, AND A METHOD FOR SECURING SAME TO A BODY

Anthony P. Taluba, Lebanon, N.J.

Filed Mar. 3, 1977, Ser. No. 773,950

Int. Cl.[2] B23P *11/02;* **A63H** *3/46;* **B29C** *17/07*

U.S. Cl. 29—453 **12 Claims**



1. The method of molding a hollow elastomer appendage for attachment to a body including a substantially circular outwardly directed flange at the attachment site which comprises the method steps of:

molding said appendage to include an annular lip integral with the perimeter of an opening in said appendage, said lip molded to include at least one groove around the perimeter of said opening, folding said grooved lip on said one groove into said opening, whereby in said folded relation an upper edge of said lip is constructed to engage an under surface of said flange.

4. The method of fabricating a hollow body of elastomer material comprising a molded primary body and one or more separately molded hollow appendages which comprises the steps of:

molding the primary body to include a connecting member having an outwardly directed substantially circular annular flange at the site of attachment of one said appendage,

molding a hollow appendange to include a substantially circular opening formed for attachment to the flanged connecting member of said primary body,

forming simultaneously with the molding of said appendage an annular lip depending from the opening in said appendage, said lip having at least one annular groove and being constructed to fold on said one groove into the opening of said appendage, and assembling said primary body and said hollow appendage by engaging an upper edge of said inwardly folded lip in mating relation with at least a portion of the outwardly directed annular flange of the connecting member of said primary body.

6. A hollow elastomer appendage with an opening at one end for attachment to a body, said body having a circular outwardly extending flange at the site of attachment of said appendage to said body, said appendage comprising in combination:

an annular lip molded integrally with said opening and having at least one groove around the perimeter of said opening,

said lip being folded inwardly on said one groove to provide by its upturned edge an internal annulus for engagement with the lower surface of the outwardly extending flange of said body, thereby to secure said appendage in rotatable relationship relative to said body.

4,143,454

METHOD OF FIXING CONNECTION PARTS OF RUBBER OFFSHORE STRUCTURES

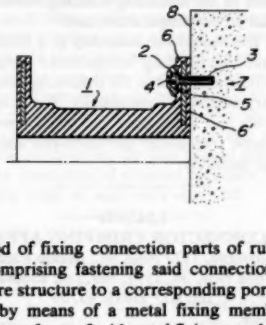
Tadashi Utsunomiya; Shigeo Ueda; Kiyotaka Kamachi, and Masatoshi Wakamiya, all of Yokohama, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed May 31, 1977, Ser. No. 801,967

Claims priority, application Japan, Jun. 4, 1976, 51-64568

Int. Cl.[2] B23P *3/00*

U.S. Cl. 29—460 **19 Claims**



1. A method of fixing connection parts of rubber offshore structures, comprising fastening said connection part of the rubber offshore structure to a corresponding portion of a connecting part by means of a metal fixing member and then covering outer surfaces of said metal fixing member and rubber areas surrounding said metal fixing member with a liquid rubber composition curable at room temperature.

4,143,455

METHOD OF PRODUCING A SEMICONDUCTOR COMPONENT

Ulrich Schwabe, Munich, and Ronald Rathbone, Taufkirchen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 773,592, Mar. 2, 1977, abandoned. This application Jul. 3, 1978, Ser. No. 921,711

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2610208

Int. Cl.[2] H01L *21/22, 21/26*

U.S. Cl. 29—571 **9 Claims**

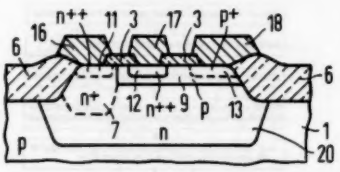
1. A process for producing a semiconductor component consisting essentially of the sequential steps of:

providing a semiconductor substrate of one conductivity type;

forming a first zone onto a first surface of said substrate, said first zone having a conductivity type different from that of said substrate;

applying a relatively thin layer of silicon nitride onto said first zone and etching a desired pattern thereon so that some areas of said first zone are uncovered;

etching at least the uncovered areas of the first zone to a depth sufficient to penetrate said first zone and form a second surface within said substrate below said first surface of the substrate and to form adjacent first zone side walls;



substantially simultaneously forming a relatively thick layer of silicon dioxide on at least the second surface of the substrate and on first zone side walls and post-diffusing said first zone so as to enlarge said first zone;

forming other space-apart zones within said first zone, said other zones having a conductivity type different from that of said first zone; and

providing electrodes for said spaced-apart zones.

4,143,456

SEMICONDUCTOR DEVICE INSULATION METHOD

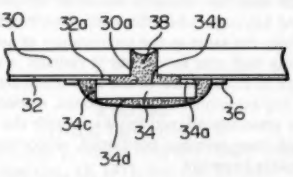
Kazuo Inoue, Higashimurayama, Japan, assignor to Citizen Watch Commpany Ltd., Tokyo, Japan

Filed Jun. 20, 1977, Ser. No. 808,216

Claims priority, application Japan, Jun. 28, 1976, 51-76213; May 11, 1977, 52-54070

Int. Cl.[2] B01J *17/00*; H01L *1/10*; H05K *3/28*

U.S. Cl. 29—588 **8 Claims**



5. A process for applying a protecting covering for a semiconductor device having a circuit board formed on its one side with an electrically conductive pattern having a bonding electrode portions, and a semiconductor chip having projecting electrodes joined to the bonding electrode portions of said electrically conductive pattern, wherein said circuit board has a through-hole opening to a bottom surface of said semiconductor chip, said process comprising the steps of:

forming a thick film of a repellent insulating material on said one side of said circuit board in a predetermined shape around said semiconductor chip by a printing technique, said repellent insulating material being selected from the group consisting of silicone resin and fluorine resin;

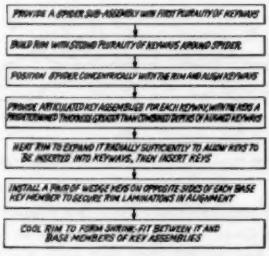
injecting a mold resin from another side of said circuit board through the through-hole thereof onto said one side of said circuit board in an area surrounded by said predetermined shape, said thick film of repellent insulating material blocking the flow of said resin material at an area outside said predetermined shape; and

hardening said mold resin to form a protecting covering for said area surrounded by said predetermined shape.

4,143,457
METHOD OF MAKING MOUNTING ASSEMBLY FOR LAMINATED ROTOR RIM OF DYNAMOELECTRIC GENERATOR ROTATABLE ABOUT INCLINED SHAFT

William J. McGahern, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 778,096, Mar. 16, 1977, Pat. No. 4,110,652.
This application Feb. 8, 1978, Ser. No. 875,959
Int. Cl.[2] H02K 15/02
U.S. Cl. 29—598 2 Claims


PROVIDE A SPIDER SUB-ASSEMBLY WITH FIRST PLURALITY OF KEYWAYS
BUILD RIM WITH SECOND PLURALITY OF KEYWAYS APPAND SPIDER
POSITION SPIDER CONCENTRICALLY WITH THE RIM AND ALIGN KEYWAYS
PROVIDE ARTICULATED KEY ASSEMBLIES FOR EACH KEYWAY, WITH THE KEYS A PREDETERMINED THICKNESS GREATER THAN COMBINED DEPTHS OF ALIGNED KEYWAYS
HEAT RIM TO EXPAND IT RADIALLY SUFFICIENTLY TO ALLOW KEYS TO BE INSERTED INTO KEYWAYS, THEN INSERT KEYS
INSTALL A PAIR OF WEDGE KEYS ON OPPOSITE SIDES OF EACH BASE KEY MEMBER TO SECURE RIM LAMINATIONS IN ALIGNMENT
COOL RIM TO FORM SHRINK-FIT BETWEEN IT AND BASE MEMBERS OF KEY ASSEMBLIES

1. A method for manufacturing a rotor for a dynamoelectric generator comprising the steps of:

(a) providing a spider sub-assembly that is rotatable around a non-vertical axis, around

(b) forming a first plurality of axial keyways in said spider at spaced points around its circumference,

(c) providing a laminated annular rim having a second plurality of axial keyways formed therein at spaced points around its inner circumference,

(d) positioning each keyway in said rim in general axial alignment, respectively, with a keyway in said spider, so the rim in concentric with the spider,

(e) providing a plurality of articulated key assemblies, each including a generally T-shaped base member and two pairs of tapered wedge keys, and forming each of said base members to have a thickness a predetermined amount greater than the distance between the bottoms of said aligned keyways when the temperature of the rim is substantially the same as the temperature of said spider,

(f) heating said rim to expand it radially a distance great anough to enable each of the base members of the articulated key assemblies to be positioned, respectively, in each of the generally aligned keyways, with the T-bar portion of each base member positioned, respectively, in one of the spider keyways,

(g) installing a pair of tapered wedge keys on each side of the neck portion of each of said base members, with the thick ends of each pair of wedge keys disposed adjacent opposite sides of the rim, thereby to secure the rim laminations in fixed relationship with respect to one another and to the spider, and

(h) cooling the rim to form a heat-shrink fit between it and each of the T-shaped base members of the key assemblies.

4,143,458
METHOD OF MAKING A THIN FILM MAGNETIC HEAD ASSEMBLY

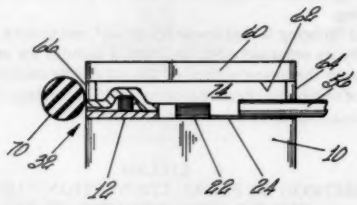
George W. Gibson, Goleta, Calif., assignor to Applied Magnetics Corporation, Goleta, Calif.

Filed Jun. 24, 1977, Ser. No. 809,924
Int. Cl.[2] G11B 5/42
U.S. Cl. 29—603 9 Claims

1. A method of making a thin film magnetic head assembly having a substrate, a superstrate and a thin film magnetic transducer having preselected electrical characteristics and magnetic characteristics, mounted therebetween, said thin film magnetic transducer having a transducing portion thereof positioned adjacent opposed edges of the substrate and superstrate comprising

positioning at least one spacing member having a thickness at least equal to the thickness of the thin film magnetic transducer between the substrate and the superstrate forming a predetermined space therebetween and spaced opposed edges at one periphery thereof;

placing a quantity of insulating bonding material adjacent the spaced opposed edges and in the vicinity of the transducing portion of the thin film magnetic transducer, said insulating bonding material being selected of a material which is electrically and magnetically compatible with the thin film magnetic transducer and which has a melting point temperature below a thermal stress temperature at which at least one of the electrical characteristics and the



magnetic characteristics of the thin film magnetic transducer are permanently distorted;

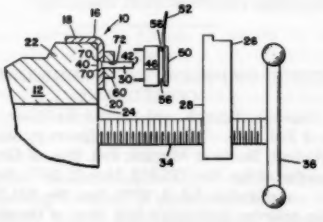
controllably heating the substrate, superstrate, thin film magnetic transducer and the spacing member sub-assembly at a heating rate which permits substantially uniform expansion thereof up to a bonding temperature located in a bonding temperature range between the melting point temperature of the insulating bonding material and below the thermal stress temperature; and

maintaining the heated sub-assembly at a bonding temperature within the bonding temperature range for a time period sufficient to enable the insulating bonding material by capillary action to substantially fill the space between the substrate and superstrate and to encapsulate said thin film magnetic transducer therebetween and form a magnetic head assembly.

4,143,459
CABLE CONNECTOR CRIMPING APPARATUS

David O. McGoveran, 1177 Noel Dr., Menlo Park, Calif. 94025

Filed Nov. 30, 1977, Ser. No. 855,820
Int. Cl.[2] H01R 43/04
U.S. Cl. 29—749 8 Claims



1. A cable connector crimping apparatus for a connector having a plurality of pins, for use in combination with a standard vise or the like having first and second jaws whose front surfaces can be controllably closed together, comprising:

stop means for preventing the vise jaws from closing beyond a certain position corresponding to the point at which crimping of the connector has been completed;

secondary spacing means operatively associated with said stop means for preventing the pins of said connector from being damaged during crimping;

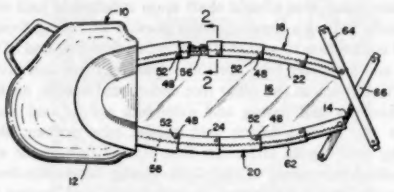
means for positioning said stop means and said secondary spacing means with respect to said front surface of said first jaw of said vise such that as said jaws are closed together, a connector and cable positioned therebetween are crimped together thereby.

4,143,460

CHAIN SAW GUARD

Robert W. Shean, 158 Dickenson Rd., West Webster, N.Y. 14580

Filed Feb. 22, 1978, Ser. No. 879,979
Int. Cl.² B27B *17/02*
U.S. Cl. 30—382 **10 Claims**



1. In a chain saw having a contour plate which defines a path over which a continuous saw chain in driven along upper and lower reaches and between forward and rearward ends of said plate, a guard mechanism which comprises first and second pluralities of U-shaped channel members disposed over said saw chain along the upper and lower reaches of the saw chain path, said first plurality of channel members being disposed in telescoping relationship with each other, said second plurality of channel members also being disposed in telescoping relationship with each other, spring means for biasing said first and second pluralities of telescoping channel members toward the forward end of said plate to extend said first and second pluralities of telescoping members to cover said saw chain, and pivotal members disposed on the ones of said first and second pluralities of channel members at the forward ends of said pluralities of channel members and engageable with the work to be sawed for overcoming the bias of said spring means and retracting said pluralities of channel members rearwardly to expose said saw chain as said work is sawed.

4,143,461

DART DEPTH GAUGE

Leona R. Impastato, 27 Gray Rock Ln., Chappaqua, N.Y. 10514

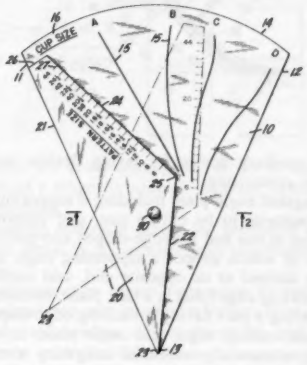
Continuation-in-part of Ser. No. 690,095, May 26, 1976, abandoned. This application Apr. 11, 1977, Ser. No. 786,398
Int. Cl.² A41H *1/00*
U.S. Cl. 33—16 **6 Claims**

1. In the process of dressmaking, the method of shaping the bosom-covering portion of a dress properly to fit the intended wearer, which method comprises the steps of:

providing a pattern for a selected garment having a bosom portion,

providing a dart depth gauge comprising first and second superposed flat members pivotally connected with one another, said members having index points which are equally spaced from said pivot and are movable toward and away from one another by relative pivotal movement of said members, said first member having a straight outer edge, said second member having an inner edge extending along a side thereof outwardly of said pivot from said index point and overlying said first member and a scale extending along said inner edge with calibrations in terms of pattern size, and said first member having on a face thereof a plurality of curves each of which is identified as breast cup size, said curves being related to the pattern size calibrations on said second member in the manner that when said members are pivoted to bring a selected pattern size calibration into coincidence with a selected breast cup size curve the distance between said index points of the two members is the correct depth of dart for the selected pattern size and the selected breast cup size,

positioning said second member relative to said first member to bring the calibration on said second member corresponding to the pattern size into coincidence with the curve on said first member corresponding to the breast cup size of the intended wearer of the garment,



applying the index points of said members as thus positioned to a side edge of the pattern for the bosom portion of the garment and marking on said pattern the location of said index points, the spacing between said index points determining the correct depth of dart for the pattern size and breast cup size of the intended wearer,

drawing on the pattern lines defining a dart of the depth determined by the spacing between said index points,

transferring to material for the bosom portion of said garment the outline of said pattern and said dart-defining lines, and

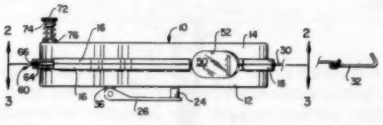
forming in said material a dart of the depth determined by the spacing of said index points.

4,143,462

CHALK LINE DEVICE

Arthur R. Gertz, 512 E. Maple, Fairview, Okla. 73737

Filed Oct. 13, 1977, Ser. No. 841,683
Int. Cl.² B44D *3/38*
U.S. Cl. 33—87 **11 Claims**



1. A chalk line device comprising:

a hollow housing having an opening at each of the opposite ends thereof;

a chalk line reel inside the housing;

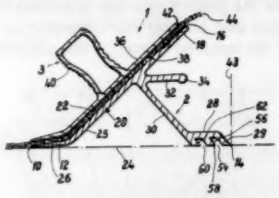
a chalk line extending from the reel through the opening at one end of the housing; and

an arc scribing disk assembly mounted in the opening at the other end of the housing and including a scribing disk having a part thereof inside the housing and a part thereof outside the housing.

4,143,463
AUXILIARY DEVICE FOR LAYING FLEXIBLE WALL AND FLOOR COVERINGS

Erich Tränkle, Belchenstrabe 48g, Herbolzheim, Fed. Rep. of Germany (7834)

Filed Dec. 1, 1977, Ser. No. 856,371
Int. Cl.[2] B43L 7/00
U.S. Cl. 33—174 G 9 Claims



1. An auxiliary device for laying flexible wall and floor coverings, comprising:

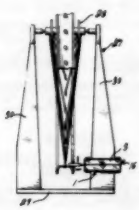
an elongated angle plate including a supporting surface for the material to be cut to size, said supporting surface having at one end a wedge-shaped end portion, the outer edge of which defines a supporting edge, and a cutting edge defined at its opposite end, said cutting edge and supporting edge lying in a base plane, said angle plate also including a part having a locating edge disposed parallel to said cutting edge, said angle plate, in cross-section, lying substantially within an imaginary triangle, with its cutting edge, supporting edge and locating edge each passing through one corner of the triangle and with said supporting surface being disposed at an angle of inclination relative to said base plane, the portion of said supporting surface between said wedge-shaped end portion and said cutting edge thereof being disposed at a greater angle of inclination to said base plane than said wedge shaped edge portion, and the distance, as measured along said supporting surface, between said supporting edge and said locating edge being equal to the distance, as measured along said base plane between said supporting edge and said locating edge; and

a pressure strip having a lower pressure surface of approximately that same length as said supporting surface of said angle plate, the cross-sectional profile of which is configured to complement the profile of said supporting surface.

4,143,464
BICYCLE WHEEL ALIGNMENT INDICATING INSTRUMENT

Etienne Lahos, St. Benoit Labre, County of Beauce, Canada

Filed Mar. 30, 1977, Ser. No. 783,008
Int. Cl.[2] G01B 3/12
U.S. Cl. 33—203.16 2 Claims

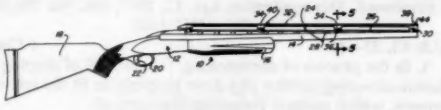


1. An alignment indicating instrument for bicycle and the like wheels operating without having to remove a tire from said wheels, comprising a casing adapted to be mounted with one face adjacent the rim of a bicycle wheel mounted for rotation about its axle, said rim having a side edge and a radially inner surface with a portion adjacent said side edge free of any obstruction, a shaft mounted in said casing for axial and rotatable movement, said shaft having a portion protruding from said one face of said casing, a crank-shaped feeler arm secured to said protruding portion of said shaft and defining an outer feeler portion radially offset relative to the rotation axis of said shaft, a lateral feeler projection fixed to said feeler arm inward of said outer feeler portion and making a substantially right angle with the latter, said outer feeler portion engageable with said portion of said radially inner surface of said wheel rim, while said lateral feeler projection is simultaneously engageable with said side edge of said rim, whereby radial deviations of said wheel rim cause rotation of said shaft upon rotation of said wheel and lateral deviations of said wheel rim will cause axial movement of said shaft upon rotation of said wheel, an indicating needle pivotally connected to said shaft within said casing about an axis normal to said shaft for first pivotal movement of said needle about said axis relative to said shaft in a plane parallel to said shaft and for second pivotal movement in a plane transverse to said shaft upon rotation of said shaft, said needle having a longer pointer portion extending from its pivotal connection to said shaft towards a first free end of said needle and a shorter base portion extending from said pivotal connection towards the other free end of said needle, an abutment fixed to said casing and extending across said needle portion and against which said needle base portion abuts, whereby said needle effects its first pivotal movement upon longitudinal movement of said shaft, spring means attached to said needle base portion and to said casing and urging said needle base portion against said abutment and movement of said shaft to an advanced protruding limit position relative to said casing face, said spring means also urging rotation of said shaft in one direction towards a limit rotated position, said casing enclosing said needle and having a viewing window at one end, the outer end of said needle pointer portion extending close to said window and visible therethrough, said viewing window having a target mark thereon with which said outer end of said needle pointer portion is adapted to register for indicating alignment of said wheel rim, both radially and laterally, and stop means in said casing determining the limit advanced and rotated position of said shaft.

4,143,465
SIGHTING DEVICE

Jerrie L. White, 3025 Stover St., Ft. Collins, Colo. 80521

Filed Aug. 29, 1977, Ser. No. 828,279
Int. Cl.[2] F41G 1/46
U.S. Cl. 33—233 9 Claims



1. For mounting above the barrel of a gun having a rib secured along the top of the barrel and including a flat horizontal web of pre-determined thickness and width, a sighting device comprising:

an elongated vertically-oriented strip of a length corresponding to a substantial portion of the lengths of said barrel and rib, said strip including a plurality of downwardly-projecting ears individually spaced successively along the length of said strip;

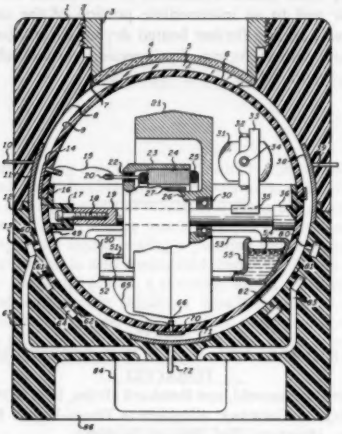
and a corresponding plurality of blocks for mounting said ears respectively to different successive portions of said strip, each of said blocks including means for fastening the block to said strip and for clamping the block to said web.

4,143,466

FREE FLOATING GYROSCOPIC COMPASS AZIMUTH PICK-OFF AND ROTOR DRIVE SYSTEM

Thomas R. Quermann, Huntington Station, N.Y., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 9, 1977, Ser. No. 776,058
Int. Cl.[2] G01C *19/28*
U.S. Cl. 33—327 13 Claims



1. A gyroscopic instrument comprising:

outer casing means having spherical interior surface means for forming inner cavity means with at least a first polar region and a first equatorial region,

gyroscope container means having exterior spherical surface means conformal with said spherical interior surface means for forming continuous gap means therebetween and having at least a second polar region and a second equatorial region,

gyroscopic rotor means disposed within said gyroscope container means for rendering same pendulous and normally maintaining said first and second polar regions in overlapping relation,

electrically conductive flotation fluid means disposed within said continuous gap means,

first electrode means disposed on said spherical interior surface means at said first equatorial region,

second electrode means disposed on said spherical exterior surface means at said second equatorial region in cooperative current conducting relation with said first electrode means and said electrically conductive flotation fluid means,

coupling means at said first and second polar regions for cooperatively coupling electrical current across said continuous gap means to said second electrode means,

said first electrode means comprising a plurality of equally spaced discrete electrode portions,

said second electrode means extending continuously about said spherical exterior surface means and having a width varying between a minimum and a maximum value as one cycle of a sinusoidal function of the equatorial azimuth angle from said minimum width value, and

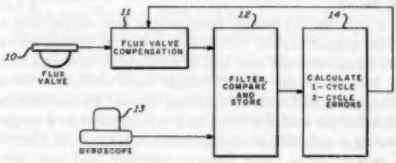
inductive means responsive to the relative magnitudes of the several currents flowing between said first and second electrode means for generating output currents representative of the relative azimuth positions of said gyroscope container means and said outer casing means.

4,143,467

SEMI-AUTOMATIC SELF-CONTAINED MAGNETIC AZIMUTH DETECTOR CALIBRATION APPARATUS AND METHOD

James R. Erspamer; John R. Jackson; Roger A. Misch, and John L. Waldrop, all of Phoenix, Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Filed May 1, 1978, Ser. No. 901,886
Int. Cl.[2] G01C *17/38*
U.S. Cl. 33—356 29 Claims



1. Apparatus for compensating for errors in the heading output signal of a magnetic azimuth detector mounted in an aircraft, comprising

inertial heading reference means for providing a heading reference signal in accordance with the heading of said aircraft,

heading compensation means responsive to said heading output signal and said heading reference signal for compensating said heading output signal for said errors in accordance with the differences between said heading output signal and said heading reference signal at a plurality of predetermined headings of said aircraft, and

drift compensation means for compensating said heading reference signal for drift of said inertial heading reference means with respect to said plurality of predetermined headings,

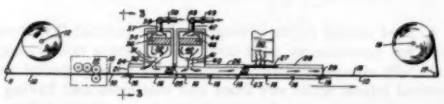
thereby providing a compensated heading output signal compensated for said errors.

4,143,468

INERT ATMOSPHERE CHAMBER

Jerome L. Novotny, 17700 Darden Rd., South Bend, Ind. 46635, and Roy S. Nickerson, Sr., 340 Marvel La., New Carlisle, Ind. 46552

Division of Ser. No. 462,986, Apr. 22, 1974, which is a continuation of Ser. No. 193,825, Oct. 29, 1971, abandoned. This application Apr. 18, 1975, Ser. No. 569,589
Int. Cl.[2] F26B *3/34*
U.S. Cl. 34—1 23 Claims



1. An inert atmosphere chamber for use in connection with a process for continuously, or semi-continuously curing under the influence of radiation, and oxygen-sensitive, radiation curable surface coating compositions on substrates including a chamber housing comprising side walls and a top portion, radiation means adjacent said chamber housing for curing said radiation curable substrates, transport means to transport said coated substrate through said chamber, a first inert gas nozzle positioned within said chamber housing before said radiation means and extending substantially across the width of said chamber housing and above said coated substrate, said first nozzle adapted to direct a uniform jet of inert gas against said coated substrate as said coated substrate passes through said chamber housing whereby the original air boundary layer is blown off and removed from said coated substrate prior to

curing of said radiation curable coating by said radiation means.

4,143,469

ENHANCING THE THERMAL CHARACTERISTICS OF MAGNETICALLY STABILIZED FLUIDIZED BEDS

Kenneth Kamholz, Cherry Hill, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Aug. 4, 1976, Ser. No. 711,500
Int. Cl.[2] F26B *3/08*
U.S. Cl. 34—1 **8 Claims**

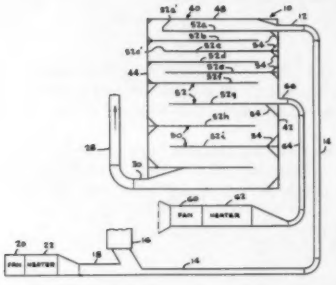
1. In a process for stably fluidizing a bed containing solid particulate magnetizable, fluidizable material within an external force field, wherein said bed of fluidizable material is fluidized by a flow of gas therethrough with sufficient force to oppose an external force field acting on said particulate material, and wherein said fluidized bed is subjected to a magnetic field having a substantial component positioned in the direction of said external force field to stabilize said bed, the improvement which comprises: controlling the thermal characteristics of the magnetically stabilized fluidized bed by monitoring the temperature in the fluidized bed in at least one selected point within said bed by periodically removing and reapplying the magnetic field at a length of time and at a frequency such that the temperature gradients at said selected point(s) is maintained within a predetermined range with the proviso that the magnetic field is reapplied before the bed visibly exhibits "boiling" or "bubbling" typical of unstabilized fluidized bed operation.

4,143,470

EVEN HEAT PARALLEL FLOW TOWER DRYER

Arvel L. Vandergriff, 1701 Heffner St., Corcoran, Calif. 93212

Filed Aug. 16, 1977, Ser. No. 826,945
Int. Cl.[2] F26B *3/10*
U.S. Cl. 34—10 **13 Claims**



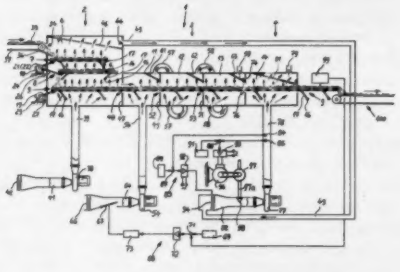
1. Seed cotton dryer apparatus of the parallel flow tower type for conditioning seed cotton for ginning comprising, a vertically elongated drying tower casing having spaced apart vertical lateral walls and front and rear sides and having an inlet adjacent the top for connection to an air duct through which seed cotton is conveyed to receive cotton-conveying heated drying air and cotton conveyed by the drying air and having an air and cotton outlet adjacent the bottom, means for conveying heated drying air and seed cotton to the air duct, means for heating the drying air, a plurality of vertically spaced horizontal metallic shelves fixed in the casing transversely spanning the casing between said lateral walls, said shelves from the uppermost to the lowermost commencing alternately from opposite sides of the casing and each terminating short of the side opposite its commencement thereby defining a continuous restricted zig-zag flow path from the upper end to the lower end of the casing communicating respectively with said inlet and said outlet, the heated drying air and cotton conveyed thereby being admitted to the upper end of said flow path at said inlet to be circulated through said flow path for evaporating moisture from the cotton in the dryer while the drying air impels the cotton along the flow path, the successive shelves in an upper portion of the dryer apparatus forming a first predetermined vertical subsection having a smaller vertical spacing between successive shelves than the vertical spacing between successive shelves in the remaining portion therebelow forming a second vertical subdivision to provide a higher heated drying air velocity of said drying air over the shelves in said first subdivision than over the shelves in said second subdivision along said flow path, and additional heated air supply duct means connected to the means for heating drying air and to an intermediate portion of the casing for continuously adding further heated drying air without cotton to said flow path at the top of said second vertical subdivision during operation of the dryer apparatus.

4,143,471

METHOD AND APPARATUS FOR CONDITIONING TOBACCO

Waldemar Wochnowski, and Reinhard Hohm, both of Hamburg, Fed. Rep. of Germany, assignors to Hauni-Werke Korber & Co. Kg., Hamburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 220,599, Jan. 25, 1972, Pat. No. 3,799,176. This application Mar. 7, 1974, Ser. No. 448,949
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1971, 2103671; Jun. 9, 1971, 2132226; Jul. 14, 1973, 2335970
The portion of the term of this patent subsequent to Mar. 26, 1991, has been disclaimed.
Int. Cl.[2] F26B *3/08*
U.S. Cl. 34—28 **31 Claims**



1. A method of drying tobacco, comprising the steps of feeding a continuous stream of moist tobacco particles into an elongated path; transporting the particles of said stream along said path; subjecting the particles to the homogenizing action of a heated first gas current in a first portion of said path, including maintaining said current in a state of hygroscopic equilibrium with the particles; reducing the moisture content of tobacco particles in a second portion of said path; subjecting the particles to the action of a heated second gas current in a third portion of said path, including establishing a state of hygroscopic equilibrium between said second current and the particles; removing the particles from said path in a continuous stream; monitoring the moisture content of the particles downstream of said second portion of said path; and intensifying said moisture content reducing step when the monitored moisture content exceeds a predetermined value and vice versa.

4,143,472
DISPLAYING MAGNETIC PANEL AND ITS DISPLAY DEVICE

Yasuzo Murata, Ninomiya; Takeo Yokoyama, Yokohama, and Hiroshi Murata, Kamakura, all of Japan, assignors to Pilot Man-Nen Hitsu Kabushiki Kaisha, Tokyo, Japan

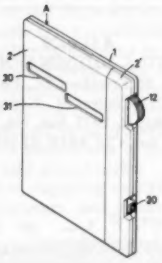
Filed Dec. 29, 1977, Ser. No. 865,550
Claims priority, application Japan, Apr. 11, 1977, 52-41164
Int. Cl.² B43L 1/12
U.S. Cl. 35—66 13 Claims

1. A displaying magnetic panel which comprises: a liquid containing panel having two oppositely arranged substrates at least the display section of which is transparent or semi-transparent and a liquid sealing space between said two substrates; and a dispersing liquid having a yielding value higher than 5 dyne/cm² sealed in said space, said dispersing liquid prepared with fine magnetic grains, a coloring agent, a dispersing medium, and a fine grain thickener which is selected from the group consisting of fine powder silicic acid, fine powder silicate, fine powder alumina, fine powder calcium carbonate and fine powder magnesium carbonate.

4,143,473
MEMORIZING AID

Yoshihide Mitsuya, Osaka, Japan, assignor to Sakura Color Products Corporation, Osaka, Japan

Filed Jul. 25, 1977, Ser. No. 818,930
Claims priority, application Japan, Aug. 10, 1976, 51-96639
Int. Cl.² G09B 1/24
U.S. Cl. 35—76 3 Claims

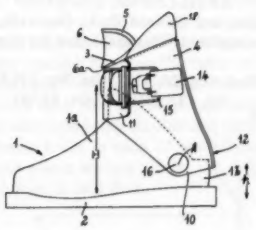


1. A memorizing aid comprising:
a casing having at least one viewing opening in at least one surface thereof;
a base plate removably mounted within said casing by a frame;
an endless tape mounted about said base plate and extending over spaced opposite ends thereof, said endless tape having thereon information to be memorized, said information being arranged in units spaced along the endless length of said endless tape;
a drive roller rotatably mounted at one of said ends of said base plate, said drive roller being in engagement with said endless tape, such that rotation of said drive roller causes said endless tape to move about said base plate; and
means for selectively intermittently rotating said drive roller in opposite directions, and for thereby selectively intermittently moving said endless tape in opposite directions about said base plate, by an amount equal to the spacing between adjacent said units of information on said endless tape, whereby a selected said unit of information on said endless tape is selectively positioned to be visible through said at least one viewing opening in said casing, said rotating means comprising a selectively operable pushbutton, an elongated reciprocating member having a first end adjacent said pushbutton, said reciprocating member adapted to be axially reciprocated upon operation of said pushbutton, a rotor fixed to said drive roller, said rotor including first and second oppositely directed ratchet wheels spaced from each other axially of said drive roller, a second end of said reciprocating member being bifurcated and having first and second pawls selectively engageable with said first and second ratchet wheels, respectively, a selector member connected to said reciprocating member and selectively movable between a first position, whereat said reciprocating member is laterally displaced in a direction axially of said drive roller such that said first pawl engages said first ratchet wheel upon selective operation of said pushbutton and axial reciprocation of said reciprocating member to thereby rotate said drive roller and move said endless tape in a first direction, and a second position, whereat said reciprocating member is laterally displaced in a direction axially of said drive roller such that said second pawl engages said second ratchet wheel upon selective operation of said pushbutton and axial reciprocation of said reciprocating member to thereby rotate said drive roller and move said endless tape in a second direction opposite to said first direction.

4,143,474
SKIBOOT

Roger Blanc, Izeau, France, assignor to Garmont S.p.A., Volpago del Montello (Treviso), Italy

Filed Mar. 2, 1978, Ser. No. 882,628
Claims priority, application France, Mar. 4, 1977, 77 07235
Int. Cl.² A43B 5/04, 23/26
U.S. Cl. 36—120 10 Claims



1. A skiboot comprising:
a sole adapted to underlie a foot;
a vamp secured on said sole and having a closed toe portion and an upwardly and backwardly open heel portion;
a rear upper part on said heel portion and having a pair of forwardly projecting flaps;
a pivot between said rear upper part and said vamp at said heel portion of said vamp and behind said flaps of said rear upper part;
a tongue secured to and extending upwardly from said vamp inside said rear upper part between said flaps thereof and having above said flaps a forwardly projecting shoulder; and
a closure between said flaps for securing same together in front of said tongue and underneath said shoulder thereof.

4,143,475

SNOW BLOWERS

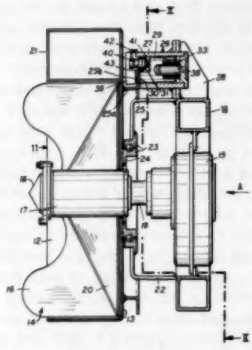
Alfred Schmidt, St. Blasien, and Günther Fritz, Wehr, both of Fed. Rep. of Germany, assignors to Firma Ing. Alfred Schmidt GmbH, Fed. Rep. of Germany

Filed Nov. 4, 1977, Ser. No. 848,505

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1977, 2725911

Int. Cl.[2] E01H 5/00

U.S. Cl. 37—43 C 10 Claims



1. A centrifugal snow blower for clearing snow comprising a frame, a fan rotatable about a central axis supported on said frame and a housing surrounding said fan having a peripheral wall defining at least an opening in direction of clearing and a duct extending tangentially for the ejection of snow therefrom, means for supporting such housing for rotative adjustment about the central axis comprising a central bearing journaling said housing to said frame, an annular guide member secured to said housing concentric with the central axis and at least one releasable braking device supported on said frame for cooperation with said guide member to fix said housing in selective rotative positions.

4,143,476

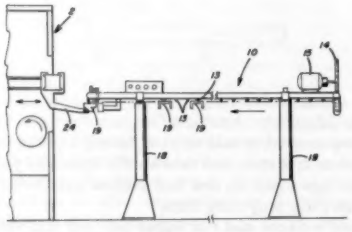
DEVICE FOR ARRANGING AND TRANSPORTING ARTICLES OF LAUNDRY

John P. Holmes, and Edward R. L. Nazareth, both of Pittsburgh, Pa., assignors to Hospital Linen Service Facility, Pittsburgh, Pa.

Filed Aug. 26, 1977, Ser. No. 827,851

Int. Cl.[2] D06F 67/04, 69/00

U.S. Cl. 38—7 7 Claims



1. In a system for automatically feeding flatwork, laundry or the like to an ironing machine which comprises a feeder that grasps two corners of one edge of the flatwork, spreads the corners and lays the edge on a device for moving the flatwork to the ironing machine, the improvement comprising an arranging and transporting device upon which the flatwork may be manually hung at spaced operator stations by a plurality of operators and advanced past the feeder whereat it is taken by the feeder, said arranging and transporting device comprising a continuous chain, a frame for supporting the continuous chain and means for orbiting the chain past said operator stations and the feeder, spaced pairs of heads secured to the chain, said heads having spaced pairs of jaws into which a portion of the edge of the flatwork near the corners of said edge may be forced such that each head presents a taut portion of the flatwork, means synchronizing the feeder and the arranging and transporting device such that the feeder may enter the continuously moving heads to grasp the taut portion of the flatwork held therein and withdrawn with the flatwork.

4,143,477

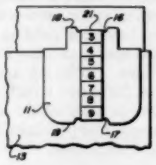
VARIABLE INDEX TAB FOR A FILE FOLDER

Henri M. Reynolds, 106 Hillcrest Dr., Macungie, Pa. 18062

Filed Jun. 9, 1977, Ser. No. 805,073

Int. Cl.[2] B42F 21/00

U.S. Cl. 40—359 16 Claims



1. A variable index tab for a file folder comprising

a relatively flat base member including a bendable portion adapted to be affixed about an edge of said file folder, said base member being formed with a notch at two opposite sides thereof; and

a rotatable strip of flexible material circumscribing said member and engaged within said notches, said strip carrying a series of identifying indicia.

4,143,478

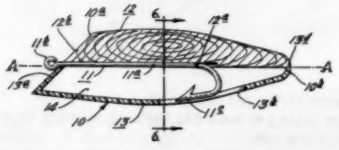
VARIABLE FLOATING HIDDEN HOOK FISHING LURE

Charles P. Nicholas, 56 President St., Lynn, Mass. 01902, and Richard Hooper, 216 Central St., Georgetown, Mass. 01833

Filed May 2, 1977, Ser. No. 792,700

Int. Cl.[2] A01K 85/00

U.S. Cl. 43—42.1 1 Claim



1. A fishing lure, comprising:

a relatively rigid back member fabricated of buoyant material,

a hook having an elongated shank mounted along substantially its entire length to the underside of said back member, a tip portion depending therefrom intermediate the ends of the back member, and an integral eye in front of the back member,

a belly member having a relatively thin flexible wall of elastomeric material depending from the periphery of said back member for cooperating therewith to define a cavity for containing and concealing the tip portion of said hook, said belly member having a slot below the tip of the hook sized to permit passage therethrough of the tip when the

belly member is compressed upwardly toward the back member by a striking fish,

said back member having a rearwardly-inclined leading end surface and said belly member having an upwardly and rearwardly inclined leading end surface forming a lower extension of said back member leading surface for causing the lure to dive when pulled through the water,

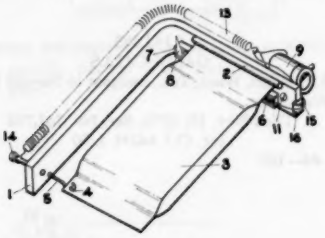
said tip of said hook being inclined at an acute angle relative to the back member and being fixedly mounted thereto in depending relation therefrom so as to provide a self-setting hooking action irrespective of the striking angle of a fish.

4,143,479

FISH BAIT DISPENSER

William Kingston, 47 Mespil Rd., Dublin, Ireland

Continuation of Ser. No. 450,262, Mar. 11, 1974, abandoned.
This application May 17, 1976, Ser. No. 687,277
Int. Cl.[2] A01K *97/02*
U.S. Cl. 43—44.99 **5 Claims**



1. A dispenser for use in fish traps disposed under water in the sea for automatically dispensing fish bait after immersion in sea water for a predetermined period of time, said dispenser comprising:

an hermetically sealed rupturable container for said bait;

a frame secured peripherally to said container;

a timer supported on said frame and incorporating a galvanic couple, said couple being constituted by first and second metals having different positions in the galvanic series in sea water, the second metal being positioned below said first metal, the first metal being dissolved in sea water by galvanic action, the time required for dissolution (which is equal to said period) being determined by the original quantity and and surface area of the first metal and the surface area of said second metal;

means which, when rupturing energy is supplied thereto, ruptures said container, said means being supported on said frame; and

a source of rupturing energy supported on said frame and coupled both to said timer and said means, the energy in said source being released therefrom and supplied to said means to cause same to rupture the container when said first metal is dissolved.

4,143,480

CRAWFISH TRAP

Daniel A. Bott, 9568 Bonnydune, Shreveport, La. 71116

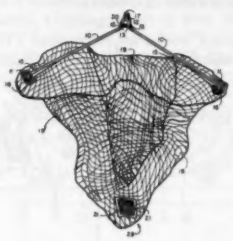
Filed Nov. 4, 1977, Ser. No. 848,459
Int. Cl.[2] A01K *69/10*
U.S. Cl. 43—105 **20 Claims**

1. A crawfish trap comprising:

(a) A first frame member shaped generally in the form of a "V" defining a first pair of free-standing legs and having a loop formed in the apex thereof;

(b) A second frame member shaped generally in the form of a "V" defining a second pair of free-standing legs and having a hook formed in the apex thereof for removable engagement with said loop; and

(c) Open mesh netting covering all of the bottom area and extending upward to cover a portion of the side area and fitted on said first frame member and said second frame



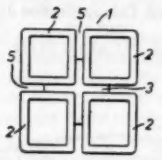
member, said netting having an access opening in the top thereof beneath said loop and said hook.

4,143,481

EDUCATIONAL TOY

Stephen J. Loechel, Unit 2, 6 Bray Ave., Klemzig, South Australia, Australia (5087)

Filed Dec. 15, 1976, Ser. No. 750,697
Int. Cl.[2] A63H *33/08*
U.S. Cl. 46—26 **5 Claims**



1. An educational toy, the toy comprising at least a pair of blocks each having at least one slot in a plurality of faces of the block, each said block being formed of four square tubes of equal size connected in parallel laterally aligned relation by a cross-shaped joiner piece, said joiner piece having four legs of equal size and having a respective square tube positioned in each quadrant of the joiner piece and extending beyond the free ends of the legs forming said quadrant, said legs thus determining the spacing between the tubes to form the slots and also determining the depth of the slots, and at least one strip dimensioned such that the strips are snugly received in said slots, each said strip being flexible and such that when said strip interconnects a slot in each of two blocks positioned so that the respective slots are non planar, the strips are deflected and stressed to lock in said slots.

4,143,482

AMUSEMENT DEVICE

Burton C. Meyer, Downers Grove; Donald F. Nix, Hanover Park, and Allison W. Katzman, Chicago, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jun. 6, 1977, Ser. No. 803,476
Int. Cl.[2] A63H *33/00*
U.S. Cl. 46—43 **23 Claims**

1. An amusement device, comprising:

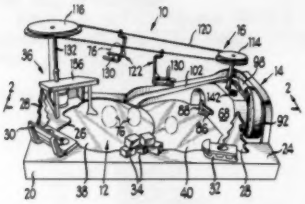
a base having a loading station and an unloading station;

at least one rotatable platform mounted on the base and having a portion thereof adjacent said loading station and a portion adjacent said unloading station for receiving playing pieces and randomly and haphazardly delivering said playing pieces to said unloading station;

recirculating means for receiving a playing piece from the

unloading station and for delivering said playing piece to the loading station on said base;

an inlet means adjacent said unloading station for receiving a playing piece from said platform;



an outlet means adjacent said loading station for delivering said playing piece to said platform; and

selectively operable access means adjacent said unloading station to control movement of said playing pieces thereinto.

4,143,483

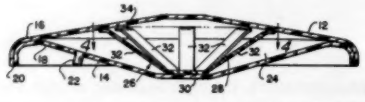
SOUND-EMITTING TOY FLYING SAUCER

Harry P. Kifferstein, 27250 Harvard Rd., Southfield, Mich. 48076, and Warren M. Kifferstein, 29632 Middlebelt, Farmington Hills, Mich. 48024

Continuation-in-part of Ser. No. 739,653, Nov. 8, 1976, Pat. No. 4,117,626, which is a continuation-in-part of Ser. No. 653,786, Jan. 30, 1976, abandoned. This application Jun. 9, 1977, Ser. No. 805,127

Int. Cl.[2] A63H *33/18*

U.S. Cl. 46—74 D **7 Claims**



1. In a toy flying saucer comprising a substantially circular dome-shaped body and a downwardly extending rim formed at the periphery of said body, said body being made of lower and upper separable wall portions joined proximate said rim, at least one of said wall portions being made of a resiliently deformable material, an aperture provided in one of said wall portions, and an air flow actuated noise-making element disposed in said aperture for emitting a sound when said wall portions are allowed to be resiliently displaced relative to each other thus causing air to circulate through said noise-making element, the improvement comprising biasing means disposed between said lower and upper wall portions and operatively connected to said wall portions for displacing said wall portions relative to each other for causing air to circulate through said noise-making element.

4,143,484

DRIVE MECHANISM FOR A RUNNING TOY

Hiroichi Yonezawa, Matsudo, Japan, assignor to Kabushiki Kaisha Yoneya Gangu, Tokyo, Japan

Filed Nov. 19, 1976, Ser. No. 743,477

Claims priority, application Japan, Jul. 22, 1976, 51-96774

Int. Cl.[2] A63H *11/10*

U.S. Cl. 46—104 **6 Claims**

1. A moving toy apparatus comprising:

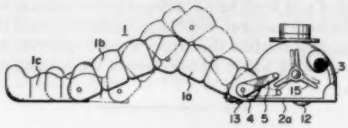
plurality of articulated body-forming members configured as a crawling animal, pivotably connected to each other including:

a first body forming member with at least one ground engaging wheel; and,

a second body forming member pivotably connected to said first body forming member;

drive means for driving said wheel thereby propelling said first body forming member;

a lever, connected to said second body forming member for



pivoting said second member with respect to said first body forming member; and,

lever actuating means rotated by said drive means and having at least one radially extending arm for contacting said lever to intermittently pivot said second body forming member with respect to said first body forming member.

4,143,485

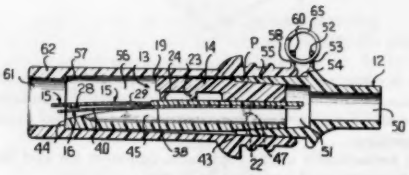
GAME CALLS

Johnny E. Stewart, Waco, Tex., assignor to Stewart Game Calls, Inc., Waco, Tex.

Filed Nov. 15, 1976, Ser. No. 741,718

Int. Cl.[2] A63H *5/00*

U.S. Cl. 46—180 **32 Claims**



27. A game call comprising a reed assembly, said reed assembly including reed means sandwiched between a reed holder and a voice channel, a barrel telescopically receiving said reed assembly, a tubular voice holder, said tubular voice holder and barrel being in telescopic relationship, means coupling said tubular voice holder and barrel in assembled relationship, and said coupling means being in the form of a coupling element received in opening means of said tubular voice holder and said barrel.

4,143,486

HYBRID WHEAT

Shivcharan S. Maan, Fargo, N. Dak., assignor to Research Corporation, New York, N.Y.

Filed Sep. 15, 1977, Ser. No. 833,444

Int. Cl.[2] A01H *1/02*

U.S. Cl. 47—58 **25 Claims**

1. A method for producing hybrid wheat seeds which comprises:

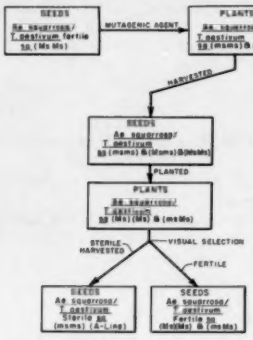
(a) inducing mutation of a specific nuclear gene in embryos of seeds of alloplasmic wheat plants, having chromosomes of wheat and a cytoplasm which is maintained fertile as the result of interaction between it and at least one specific nuclear gene;

(b) selfing plants grown from seeds of step "a" to produce seeds;

(c) selecting from seeds produced in step "b" those that contain only mutated nuclear genes in their embryos and are therefore male sterile; and,

(d) crossing plants grown from the seeds of step "c" with compatible wheat plants, having chromosomes containing

specific nuclear genes capable of maintaining fertility of the cytoplasm of plants produced in step "c", to produce hybrid wheat seeds having cytoplasm of the alloplasmic



wheat plant and embryo having at least one fertility maintaining specific nuclear gene dominating the mutated nuclear gene.

4,143,487

PLANT GROWING RECEPTACLE

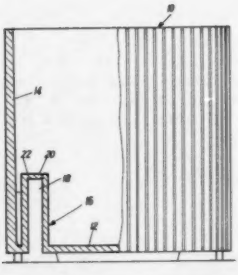
Armin Hollwarth, Goethestrasse 11, Langen, Fed. Rep. of Germany (6070)

Filed Nov. 14, 1977, Ser. No. 851,251

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1976, 7635954[U]; Nov. 15, 1976, 7635993[U]; Dec. 24, 1976, 7640650[U]; Dec. 24, 1976, 2658880

Int. Cl.² A01G *27/00*

U.S. Cl. 47—59 **22 Claims**



1. A receptacle for growing plants comprising a pot having a floor and side walls, at least one bowl-shaped inset piece disposed therein, a plurality of projections on said floor and extending thereabove, said projections each having a blind bore open to the underside of the floor of the pot, and at least one tubular projection member on said floor of said pot and extending to the vicinity of the upper edge of the walls of said pot, said tubular projection member being hollow and open at its top and to the underside of the floor of the pot.

4,143,488

FUEL SUPPLY UNIT

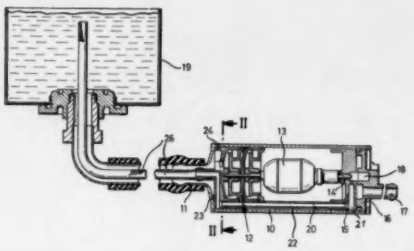
Rolf Ade; Hans Prohaska, both of Bietigheim-Bissingen, and Eckhardt Schmid, Guglingen, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed May 31, 1977, Ser. No. 801,784

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1976, 2631773

Int. Cl.² F04B *39/06*

U.S. Cl. 417—366 **2 Claims**



1. A fuel supply unit for use with and for mounting externally of a fuel tank, said fuel unit comprising:

a housing having an inlet opening for coupling to and communication with said fuel tank and said housing having an outlet opening;

a motor mounted within said housing;

a pump mounted within said housing and operatively coupled to said motor for drawing fuel from said inlet opening, pumping said fuel around said motor, and discharging said fuel through said outlet opening; and,

an enclosed return line channel having an inlet opening and an outlet opening said inlet opening of said channel having a cross-sectional area substantially less than the cross-sectional area of said outlet opening of said housing and said inlet opening of said channel being located in said housing between said pump and said outlet opening of said housing wherein said inlet opening of said channel communicates with the discharging fuel, said channel extending into said inlet opening of said housing so that when said housing is coupled to said fuel tank said outlet opening of said channel is in communication with said fuel tank at a point which is spaced-apart from said inlet opening of said housing.

4,143,489

MOULD POLISHING MACHINES

Roger Sogner, Mornant, France, assignor to Societe Nouvelle Industrielle & Commerciale d'Applications Mecaniques-S.O.N.I.C.A.M., France

Filed May 12, 1977, Ser. No. 796,173

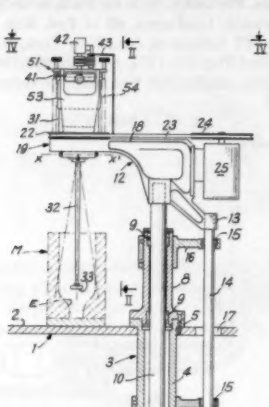
Claims priority, application France, May 14, 1976, 76 15166

Int. Cl.² B24B *5/08*

U.S. Cl. 51—43 **4 Claims**

1. A machine for polishing the internal surface of a mould comprising a base, a horizontally disposed first support above said base, means for moving said support vertically relative to said base, a first motor mounted on said first support, a second support rotatably carried by said first support, said first motor being adapted to rotate said second support, a second electric motor having a vertical axis and being carried by said second support on an axis of oscillation generally horizontal and diametral relative to the second support, said second electric motor having a downwardly directed output shaft provided with a spindle carrying a tool, eccentric means carried by the first support and comprising at least one spring carried by said second support and acting upon said second electric motor to constantly urge said second electric motor to pivot on said axis of oscillation and to cause the tool to be biased and thereby to

follow the contour of the internal surface of a mould and to be subjected, when the machine is in operation, to a rotational



movement about its own axis, a planetary displacement and a vertical displacement.

4,143,490
LENS POLISHING APPARATUS
W. N. Wood, 4934 Santa Fe, Dallas, Tex. 75223
Filed Dec. 21, 1977, Ser. No. 862,943
Int. Cl.[2] B24B *13/02*
U.S. Cl. 51—58 **13 Claims**

1. Apparatus for the coplanar movement of optical lenses for the grinding and polishing thereof relative to a polishing head disposed adjacent thereto in engagement therewith, said apparatus comprising:

a lens support frame for receiving and securely retaining an optical lens placed thereon;

a drive cam disposed beneath said lens support frame in structural engagement therewith for moving said support frame in a circular, coplanar point pattern;

a driveshaft upstanding in interengagement with an intermediate portion of said cam;

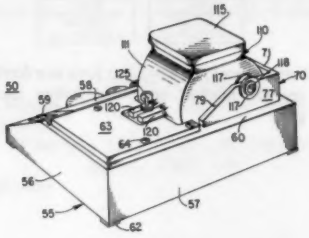
a cam hub having an aperture formed therethrough in eccentric alignment therewith for receiving said shaft therein and said cam therearound and facilitating the circular point pattern movement of said cam in conjunction with the rotation of said shaft;

first and second alignment arms coupled to said cam in slidable interengagement therewith for facilitating a circular point pattern movement of said cam about said shaft relative to the rotation thereof;

means for rotating said shaft to impart circular point pattern movement to said cam and the resultant circular movement of said lens support frame upstanding thereon; and

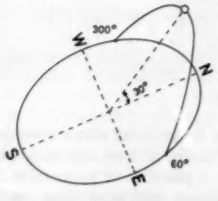
a structural support frame having said drive cam and alignment arms mounted relative thereto for the support thereof.

4,143,491
APPARATUS FOR AGITATING AND POLISHING MATERIALS
Yale A. Blanc, Glencoe, Ill., assignor to Martin Yale Industries, Inc., Chicago, Ill.
Filed Oct. 4, 1977, Ser. No. 839,197
Int. Cl.[2] B24B *31/06*
U.S. Cl. 51—163.1 **8 Claims**



1. A vibratory polishing machine for minerals, gem stones and the like comprising a base, a carriage resiliently mounted within said base, a motor fixedly mounted on said carriage and having an output shaft extending therefrom, a drum having sidewalls and rounded front and rear end walls, said drum sidewalls being pivotally mounted directly to said carriage above the mid point of the sidewalls and near the rear end wall of said drum, and means eccentrically mounted to said output shaft connecting the front end wall of said drum to said out shaft, whereby actuation of said motor causes said output shaft to rotate and said front end of said drum to vibrate vertically while the rear end of said drum remains substantially stationary, the rapid reciprocating vertical movement of said front end of said drum causing minerals, gem stones or the like in said drum to move upwardly along the wall at the rear end and then to fall inwardly toward the middle of said rum providing a polishing action.

4,143,492
CONTROLLED SUN-LIT PLANT HOUSE
Mervin E. Dunn, Pimpala Rd., Reynella, Australia (5162)
Filed Aug. 25, 1977, Ser. No. 827,666
Int. Cl.[2] E04B *7/12*; A01G *9/14, 9/24*
U.S. Cl. 52—18 **9 Claims**



1. A controlled sun-lit structure including supporting walls and a roof, the roof comprising alternate portions of clear material and opaque material in sawtooth configuration, the clear material on the roof being generally vertical and facing

the equator with the opaque material being inclined to the horizontal at an angle generally equal to the inclination of the rays of the mid-day mid-winter sun, the surface area of the clear material in the roof relative to the internal surface area of the structure being such that the area of sunlight projected internally of the structure at higher inclinations of the sun's rays is reduced duriing the summer months and increased during the winter months.

4,143,493

WINDOW FRAME STRUCTURE

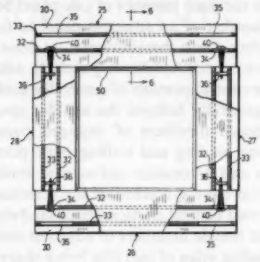
Arie Booi, Milton, Canada, assignor to Repla Designs Limited, Oakville, Canada

Filed Feb. 1, 1978, Ser. No. 874,087

Claims priority, application Canada, Dec. 16, 1977, 293298

Int. Cl.² E04B *1/66*; E06B *1/04*

U.S. Cl. 52—127 **10 Claims**



1. A glazed building unit comprising:

a glazing element comprising at least a pair of parallel sheets of glass and means supporting said sheets in a spaced-apart sealed relationship;

a pair of external frame members overlying the edges and having an outer periphery extending beyond the periphery of said glazing element;

each of said frame members having an internal and an external edge, and an inwardly extending channel along each of said edges;

internal frame members surrounding said glazing element and between said external frame members, each said internal frame member having legs engageable with an adjacent channel of said external members; and

means connecting adjacent ones of said frame members in a temperature-compensating relationship.

4,143,494

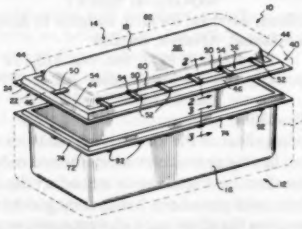
VAULT LINER REINFORCEMENT SYSTEM

Pio J. Abbate, Elmwood, Conn., assignor to Doric Products, Inc., Massillon, Ohio

Filed Mar. 9, 1978, Ser. No. 885,005

Int. Cl.² E04H *13/00*

U.S. Cl. 52—139 **15 Claims**



1. A vault lid liner constructed from a material subject to flexure under the load of a flowable cementitious material, the lid liner having an upwardly opening perimetrally extending groove separating a central portion of the lid liner from a perimetral portion of the lid liner, and a plurality of means for reinforcing the lid liner, the reinforcement means extending across the groove.

4,143,495

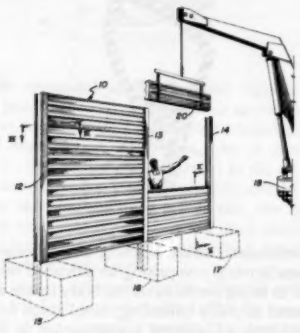
SOUND-ABSORBING PANEL

Ulrich Hintz, Hüttental-Weidenau, Fed. Rep. of Germany, assignor to Fa. Pass & Co., Huttental-Weidenau, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 734,888, Oct. 22, 1976, abandoned, which is a continuation of Ser. No. 615,295, Sep. 22, 1975, abandoned, which is a continuation of Ser. No. 493,713, Aug. 1, 1974, abandoned. This application Sep. 26, 1977, Ser. No. 836,735

Int. Cl.² E04B *1/86*

U.S. Cl. 52—145 **8 Claims**



1. A sound-absorbing element, comprising:

(a) a pair of posts adapted to be mounted in the ground in spaced, parallel relationship, the posts having facing grooves, and

(b) a plurality of panels carried in the grooves and mounted one above the other, each panel consisting of a corrugated, perforated front sheet forming the front outer wall of the panel, a corrugated rear sheet forming the rear outer wall of the panel and held in spaced non-contacting relationship to the front sheet, a perforated wall lying against the front sheet, and a body of loose particles of an elastomer material lying between the rear sheet and the perforated wall.

4,143,496

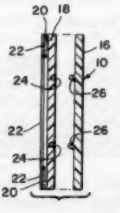
WALL DECORATING DEVICE

Joseph Destito, 17 Saxon Dr., Valhalla, N.Y. 10595

Filed Dec. 9, 1977, Ser. No. 858,947

Int. Cl.² E04C *2/20*; E04F *13/00*

U.S. Cl. 52—173 R **7 Claims**



1. A wall decorating tile device comprising

a rectangular holding member,
a frame of adhesive tape on the back of said member adjacent the edges thereof,
a peel-off film on said tape, which is removable so that said holding member can be secured to a wall, by said tape,
a rectangular decorative face member similar in size and shape to that of said holding member, and
snap fastener means removably connecting the back of said rectangular face member to the front of said rectangular holding member.

4,143,497

WEATHERSTRIP SEALING ARRANGEMENT

Lon A. Offenbacher, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 29, 1977, Ser. No. 820,141
Int. Cl.[2] E04B *1/62*
U.S. Cl. 52—400 **1 Claim**

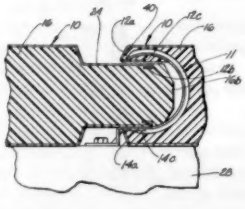
1. In a vehicular closure opening and a cooperating body flange, a weatherstrip comprising an extruded retention member adapted to being mounted on the body flange and including equally spaced laterally extending metal strips formed therein and crimped into a U-shaped configuration to form a recess having an end wall and a pair of oppositely disposed side walls, and having a predetermined width for receiving the body flange, a pair of retention lips formed on each side wall of the recess and extending toward the center of the recess to exert a pressure on the body flange to retain the weatherstrip in place thereon, and a hollow, flexible flange sealing bulb integral with and extending from the end wall of the recess, with a width greater than the thickness of the body flange and spaced inwardly from the retention lips, said sealing blub adapted to being substantially uniformly depressed toward the end wall of the recess along its entire length by the abutment of the body flange against the center of the sealing bulb to thereby prevent leakage past the flange.

4,143,498

CONCEALED FASTENER CLIP FOR BUILDING PANELS

Mulford Martin, Jr., and Donald W. Richter, both of Middletown, Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

Filed Jul. 14, 1977, Ser. No. 815,505
Int. Cl.[2] E04C *1/10*; E04B *2/32*
U.S. Cl. 52—489 **8 Claims**



1. A building construction including a support frame, a plurality of panels disposed in edge-to-edge relationship, each panel comprising an outer metal skin, an inner metal skin and an intermediate insulating core substantially filling the space between said outer and inner metal skins and joined thereto, one edge of each said panel having a recessed groove of generally U-shaped cross section, the end portions of said outer and inner metal skins at the edge of each said panel being bent and offset inwardly and engaging an edge portion of said insulating core to form a female member, said recesses groove being formed by said insulating core and said end portions of said outer and inner metal skins, each said outer and inner metal skin end portions having a return element bent and offset inwardly in parallel spaced relation to its respective skin and engaging an edge portion of said insulating core, and the other edge of said panel having an edge portion of reduced thickness, the end portion of said outer and inner metal skins at the other edge of each said panel being bent and offset inwardly and engaging an edge portion of said insulating body to form a male member, said panels being joined in edge-to-edge relationship with the male member of one panel being received by the female member of an adjacent panel to form interlocking and telescoping joins therebetween, at least one concealed fastener clip to secure adjacent panels to said support frame comprising a central portion of generally C-shaped cross section which generally follows the annular space between said male and female members of engaged panels, said central portion having leading and trailing edge portions of circular cross section and a constant radius, said trailing edge of said central portion having a standoff leg terminating in a lateral flange, each said central portion being sandwiched in between said male and female members of adjacent ones of said panels, the entire leading edge of said clip being sharpened in order to cut its own circular path into said insulating core at said female member edge of said panel between said outer metal skin and said outer metal skin return element, whereby the leading edge of said clip is anchored behind said outer metal skin return element, and fastening means to secure said lateral flange of said clip to said support frame, whereby when said panels are in lateral engagement they are secured to said support frame, the male member of one panel being held to the female member of an adjacent panel and the female member of the adjacent panel being held by said central portion of said clip, said concealed fastener clip being hidden from the outside of said construction by the panels as well as from the inside by the supporting frame.

4,143,499

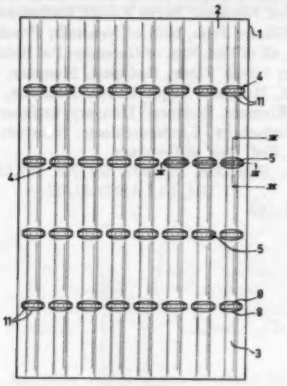
ROOFING SHEET

Gustav Näslund, Älvsbyn, Sweden, assignor to Korsträsk Mekaniska, G Näslund, Älvsbyn, Sweden

Filed Jul. 5, 1977, Ser. No. 812,772
Claims priority, application Sweden, Jul. 6, 1976, 7607724
Int. Cl.[2] E04C *2/32*
U.S. Cl. 52—630 **1 Claim**

1. A roofing sheet of the kind having sinus- or wave-shaped corrugation, having spaced elevations formed only in the wave crests of the sheet by stretching or extending the sheet from its inner surface, said elevations being arranged in several rows transverse across the sheet, each elevation comprising an upper surface with a substantially flat cross-section transforming into lateral portions of the wave troughs spaced from the deepest

point in the wave troughs, and two opposed inclined side surfaces, said transforming between the side surface of each



elevation and upper surface thereof and the upper surface of the wave crest being convex and concave, respectively.

4,143,500

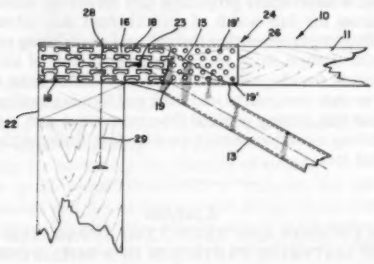
END BEARING CONSTRUCTION FOR TRUSS

Arthur C. Sanford, 2308 Bay Dr., Hillsboro Shores, Pompano Beach, Fla. 33062

Filed Mar. 13, 1978, Ser. No. 885,952

Int. Cl.² E04C *3/12*

U.S. Cl. 52—693 **8 Claims**



1. In combination, a truss having top and bottom chord members and intervening web members, a bearing support for the end of the truss, an inclined metallic web connector having an apertured terminal flange contiguous to the side of the end portion of the top chord, and a side connector plate overlying said flange and extending over said bearing support, said side connector plate having teeth intermeshing said flange apertures and embedded in said chord, a channel bearing plate having a toothed web with its teeth embedded in the top of said top chord, and apertured legs depending from said web abutting the sides of said top chord under said apertured terminal flange and intermeshing with the teeth of said side connector plate.

4,143,501

MATERABLE UNITARY EDGE MEMBER AND PANEL

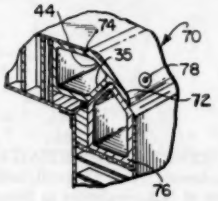
Orvil Tuttle, Los Angeles, Calif., assignor to Brunswick Corporation, Skokie, Ill.N, John G. Heimovics Brunswick Corp. One Brunswick Plaza Skokie, Ill. 60076

Continuation of Ser. No. 562,121, Mar. 26, 1975, abandoned, which is a continuation of Ser. No. 410,993, Oct. 30, 1973, abandoned. This application May 10, 1977, Ser. No. 795,567

The portion of the term of this patent subsequent to Nov. 9, 1993, has been disclaimed.

Int. Cl.² E04C *3/30*

U.S. Cl. 52—731 **14 Claims**



1. A metallic elongated unitary member capable of being used as a wall panel edge and mateable with another elongated unitary member used as a wall panel edge comprising:

an elongted edge having five planar sides in cross section wherein the first planar side is parallel to the third planar side, the second planar side is perpendicular to both the first planar side and the third planar side, the fourth and fifth planar sides meeting the first and third planar sides at obtuse angles and the fourth planar side is perpendicular to the fifth planar side, and,

self-aligning planar extension means integral with a side other than the first, second or third sides for securing one planar side of the elongated member in planar juxtapositional contact with a second elongated member.

4,143,502

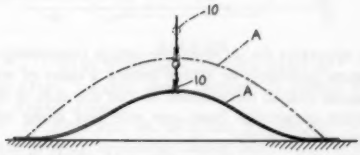
METHOD OF ERECTING A STRUCTURAL ARCH SUPPORT

Cyril T. Wyche, 1140 Parkins Mill Rd., Greenville, S.C. 29607

Continuation of Ser. No. 595,843, Jul. 14, 1975, abandoned. This application Jun. 12, 1978, Ser. No. 914,203

Int. Cl.² E04B *1/00*; E04G *21/00, 23/00*; E04B *1/32*

U.S. Cl. 52—745 **6 Claims**



1. The method of erecting a structural arch support comprising the steps of:

lifting an elongated flexible structural section by exerting a lifting force intermediate the ends of the structural section adjacent a medial portion thereof;

raising an intermediate portion of said structural section by further application of said lifting force to a predetermined elevation while continually supporting said structural section adjacent its ends during said raising so that said structural section assumes a substantially parabolic configuration;

then restraining the structural section adjacent its ends against outward movement after application of said lifting force while continuing the application of such force intermediate the ends and adjacent the ends as necessary to

support the section in such substantially parabolic configuration;

discontinuing the application of said force; and

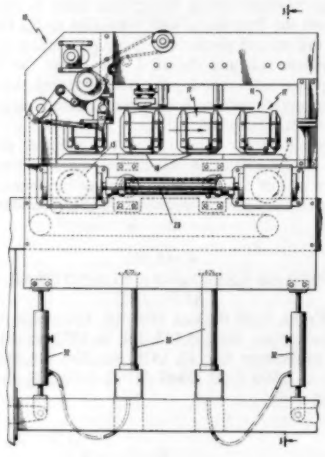
bracing said structural section laterally maintaining said structural section in elevated position acting as an arch support for carrying uniform loads in direct compression.

4,143,503

FLAT TURRET TRANSPORTING MECHANISM

Andrew W. Anderson, West Caldwell, and Paul R. Rolando, Dumont, both of N.J., assignors to Scandia Packaging Machinery Company, Clifton, N.J.

Filed Feb. 11, 1977, Ser. No. 767,966
Int. Cl.[2] B65B *11/06*; B65G *23/08*
U.S. Cl. 53—228 **17 Claims**



1. An apparatus for wrapping an article comprising:

(a) means providing an article having a sheet of wrapping material draped therearound so that the ends of the sheet project outwardly from one side and along opposing edges of the article,

(b) conveying means for moving said article along a path having a plurality of work stations,

(c) said conveying means including closed loop means having two fixed driving positions, and

(d) means for synchronously and intermittently driving said closed loop means at said two driving positions along said path,

(e) said driving means including rotatably mounted sprocket means disposed inside said closed loop means at the driving positions and means to engage the sprocket means with the closed loop means,

(f) said closed loop means being free of any driving function and being substantially completely driven by said driving means at said two driving positions,

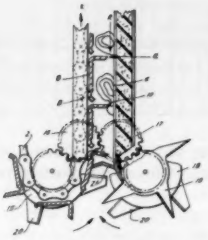
(g) whereby the article is intermittently moved from one work station to another.

4,143,504

CORNSTALK HARVESTER

Christian Noack, Guttau; Klaus Oliva, Langburkersdorf; Theodor Eistert, Neustadt; Bernd Zümpf, Rathmannsdorf; Hans P. Spaida; Günter John, both of Neustadt; Frank Pietschmann, Bautzen, all of Fed. Rep. of Germany; Pal Boltizar, Budapest, Hungary; István Fábry, Budapest, Hungary; Csongor Vida, Budapest, Hungary; Lájos Lakos, Budapest, Hungary, and Mátyás Klement, Budapest, Hungary, assignors to Veb Kombinat Fortschritt Landmaschinen Neustadt In Sachsen, Sachsen, Fed. Rep. of Germany

Filed Jan. 25, 1977, Ser. No. 762,236
Int. Cl.[2] A01D *45/02*
U.S. Cl. 56—98 **8 Claims**



1. A corn stalk cutting head for a chopping machine comprising:

means forming at least one pair of stalk guide channels having inlet ends at a leading edge of said head and outlet ends at a rear portion of said head;

an elastically deflectable stationary flank formed along one side of each of said channels, said flank comprising a support wall, a layer of a resiliently compressible material attached to said wall and a plastic foil overlying said layer and confronting the other side of the respective channel;

a chain extending along the other side of each of said channels; and

a multiplicity of entraining members mounted on said chain in closely spaced relationship, each of said entraining members being bent at right angles and formed with a shank lying along a wall of said other side of said channel and a transversely projecting foot extending substantially across the full width of said channel and substantially filling the cross section thereof, said shank being provided with friction strips resting along said wall of said other side of the channel, said feet being formed with beveled free ends proximal to said flank and forming cutting edges, said feet having profiled free extremities and said flank having a complementary profile close fitting with that of said feet.

4,143,505

COLLECTION AND RECYCLING APPARATUS FOR CROP MATERIAL PARTICLES IN A ROLL FORMING MACHINE

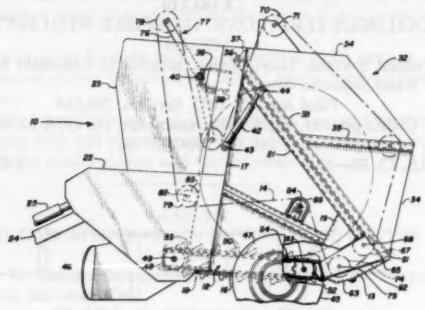
Donald L. Sheesley; Edward T. Eggers, both of New Holland, and Willis R. Campbell, Ephrata, all of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Nov. 2, 1977, Ser. No. 847,993
Int. Cl.[2] A01D *39/00*
U.S. Cl. 56—341 **12 Claims**

1. In combination with a roll forming machine for forming large round bales of crop material of the type having cooperating flexible endless upper and lower aprons driven in suitable directions to rotate the crop material into compact rolls within a roll forming region therebetween and a pivotally movable tailgate that is raised at completion of the roll forming cycle to allow the ejection of the roll, the improvement comprising:

an elongation of said tailgate at its lowest and rearmost point

to form a collection pan for particles of crop material, said pan enclosing at least a portion of said endless upper apron such that the movement of said endless upper apron cooperatively functions with said pan to return the crop particles to said roll forming region for compressive inclusion in the crop roll.

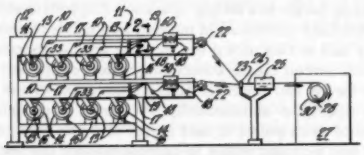


4,143,506

METHOD AND APPARATUS FOR INTRODUCING A STRAND INTO A CONTINUOUSLY ADVANCING ROVING

Richard H. Pierce, Columbus, and Arnold J. Eisenberg, Granville, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 23, 1977, Ser. No. 864,069
Int. Cl.[2] B65H *69/06*
U.S. Cl. 57—22 **11 Claims**



1. Apparatus for combining an auxiliary strand with a plurality of strands comprising:

a frame having a plurality of positions, each position adapted to support a package of strand;

means for advancing the plurality of strands;

first guide means positioned to maintain the advancing strands and the auxiliary strand along spaced apart paths approaching an after-defined second guide means;

second guide means located intermediate the first guide means and an after-defined insertion means adapted to position said advancing strands in a first region of said second guide means and said auxiliary strand in a second region of said second guide means spaced from the first region; and

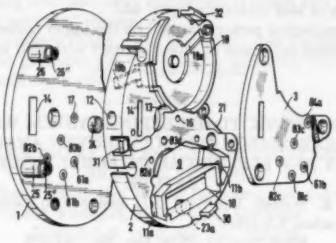
insertion means adapted to engage the auxiliary strand with the advancing strands such that the auxiliary strand is advanced therewith in the absence of stopping said advancing strands, said first guide means, second guide means, and insertion means being adapted to effect the automatic movement of the auxiliary strand from the second region into the first region upon activation of said insertion means to permit the staging of the strand from any position as another auxiliary strand in the absence of stopping the advancing strands.

4,143,507

BATTERY OPERATED ELECTRONIC WATCH

Wolfgang Ganter, Schramberg, and Albert Ginter, Lauterbach, both of Fed. Rep. of Germany, assignors to Firma Gebruder Junghans GmbH, Schramberg, Fed. Rep. of Germany

Filed Jul. 8, 1977, Ser. No. 814,088
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1976, 2632303
Int. Cl.[2] G04B *19/24, 27/00*; G04C *3/00*
U.S. Cl. 58—4 A **11 Claims**



1. A battery operated watch comprising

a one-piece base plate;

a one-piece bridge;

a one-piece carrier plate formed of insulative material disposed between said base plate and said bridge;

said base plate and said bridge engaging opposing surfaces of said carrier plate so that the spacing between said base plate and said bridge is determined by the thickness of the carrier plate;

actuating means adapted to activate indicator hands of the watch, said actuating means comprising:

a motor mounted in a first pocket in said carrier plate,

an electronic block unit mounted in a second pocket in said carrier plate and including an oscillator and electronic circuit for operating said motor,

a gear train arranged to drive the indicator hands, said gear train being driven by said motor and including a plurality of intermeshing gears mounted on axles, said axles each including first and second ends rotatably mounted in said bridge and base plate, respectively, said axles passing through openings in said carrier plate, and

means for securing said base plate, bridge, said carrier plate together including a plurality of pillars extending between said base plate and said bridge.

4,143,508

ELECTRONIC CIRCUIT BLOCK

Hideshi Ohno, Sayama, Japan, assignor to Citizen Watch Co. Ltd., Tokyo, Japan

Filed Jun. 16, 1976, Ser. No. 696,487
Claims priority, application Japan, Jun. 19, 1975, 50-74786
Int. Cl.[2] G04C *3/00*
U.S. Cl. 58—23 R **3 Claims**

1. An electronic circuit block for use in a timepiece and for mounting circuit components having terminals such as integrated circuits, and condensers having terminals for connection in a circuit, said circuit block comprising:

(a) a substrate having

(b) upper and lower connection surfaces for providing electrical connections to said circuit components,

(c) a component-receiving recess in said upper connection surface for mounting at least one circuit component in said substrate with the terminals thereof positioned on the plane of said upper connection surface,

(d) an insulating layer of polyimide resin having upper and lower surfaces, said insulating layer formed on said upper connection surface of said substrate and between and over said component and said recess, the lower surface being adjacent said upper connection surface,

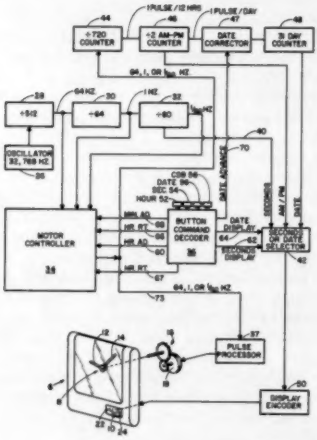
(e) said insulating layer having excluded areas adjacent said terminals, said terminals passing through the excluded areas of said insulating layer, and

(f) a conductive pattern formed on the upper surface of said insulated layer and in direct contact with said terminals.

4,143,509
ELECTRONIC TIME-KEEPING SYSTEM WITH ELECTRO-MECHANICALLY-DRIVEN ANALOG DISPLAY AND ELECTRICAL INTEGRAL HOUR RESET FEATURE

Gerhard E. Weibel, Deerfield, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Nov. 22, 1976, Ser. No. 743,875
Int. Cl.² G04C *3/00*; G04B *27/00*
U.S. Cl. 58—23 D **9 Claims**



1. In an electronic time piece, a time-keeping system having an electromechanically driven, analog-type time display, and having a purely electrical integral hour reset feature, said system comprising:

an analog time display including hour and minute hands driven through a mechanical transmission by a fast-response electromechanical motor;

a stable oscillator generating a high frequency time base signal;

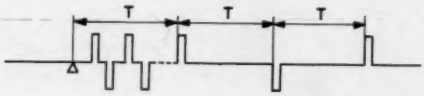
a chain of frequency dividers coupled to said oscillator for developing a time-keeping signal at a minute-related frequency for driving said analog time display in a normal time-keeping mode, and for developing hour reset pulses at a frequency much higher than one pulse per second for driving said analog time display during an integral hour reset operation; and

control means including counter means and memory means coupled to said chain of frequency dividers and responsive to an integral hour reset command for causing said analog time display to be rapidly driven by a burst of hour reset pulses whose number equals precisely that number of pulses required to move said hour hand in exact compliance with said command, and then for automatically returning said analog time display to said normal time-keeping mode.

4,143,510
ANALOGUE ELECTRONIC TIMEPIECE WITH SETTING MEANS

Tadashi Sakuma, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Apr. 15, 1977, Ser. No. 788,014
Claims priority, application Japan, Apr. 16, 1976, 51-43906
Int. Cl.² G04B *27/08*
U.S. Cl. 58—85.5 **6 Claims**

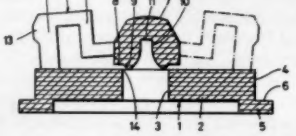


1. An analogue electronic timepiece comprising a minute hand mounted on a cannon pinion, an hour hand mounted on an hour wheel, an electric motor having a rotor and rotor pinion, electronic circuit means for producing periodic pulses at a predetermined rate and delivering said pulses to said motor to drive it, a speed-reducing gear train connecting said rotor pinion with said cannon pinion and said hour wheel, said gear train comprising a train of intermeshing gears having backlash between successive gears of said gear train, and means for manually setting both of said minute hand and hour hand to amend the time displayed by said timepiece, said setting means comprising a setting wheel and means for rotating said setting wheel in one direction to move said hands clockwise and for rotating said setting wheel in the opposite direction to move said hands counterclockwise, and means coupling said setting wheel with said gear train approximately midway between said rotor pinion and said cannon pinion and hour wheel so that the total backlash generated in moving said hands clockwise by said setting means in a setting operation is approximately equal to the backlash generated in moving said hands counterclockwise by said setting means in a reverse setting operation, said electronic circuit means comprising means controlled by said setting means and operable at the conclusion of the manual setting operation automatically to supply a predetermined number of extra pulses to said motor at a rate faster than the rate of said periodic pulses to compensate for the backlash in said gear train.

4,143,511
SHOCK-ABSORBING BEARING FOR TIMEPIECE MOVEMENTS

Peter Bachmann, Bettlach, Switzerland, assignor to Ebauches Bettlach S.A., Solothurn, Switzerland

Filed Nov. 11, 1977, Ser. No. 850,675
Claims priority, application Switzerland, Nov. 22, 1976, 14660/76
Int. Cl.² G04B *31/02*; F16C *27/06*
U.S. Cl. 58—140 A **8 Claims**



1. In a shock-absorbing bearing for a timepiece movement,

of the type wherein a one-piece plastic shock-absorbing element including a bearing-block portion, a bearing-cap portion, and a resilient zone connecting said portions is fitted in an opening in a metal support member, the improvement comprising:

seating means forming part of said bearing-block portion,

centering means forming part of said bearing-cap portion, and

biasing means forming part of said resilient zone and cooperating with said support member for pressing said centering means axially against said seating means.

4,143,512

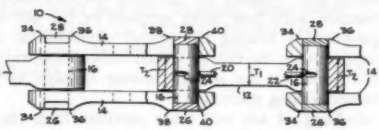
ANTI-COLLAPSING CHAIN HAVING LOOP CENTER LINK

Harry W. Templin, Indianapolis, Ind., assignor to FMC Corporation, San Jose, Calif.

Filed Feb. 21, 1978, Ser. No. 879,037

Int. Cl.² F16G *15/04*

U.S. Cl. 59—85 **8 Claims**



1. In a chain having a loop center link that defines an elongated opening, a predetermined diameter pin extending transversely through the center link and the elongated opening, the improvement comprising a lug projecting inwardly from the center link to restrict the elongated opening opposite the lug to a transverse dimension that is less than the predetermined diameter of the pin, said lug being spaced longitudinally of the opening from an adjacent opening end by a distance enabling the pin to fit between the adjacent opening end and the lug, said pin having a transverse groove for receiving the lug when the pin is in a predetermined rotational angular relationship with the center link, thereby enabling the pin to be moved past the lug in directions to and from the end of the elongated opening when the pin is in the predetermined rotational angular relationship and preventing collapse of the chain when the predetermined rotational angular relationship is not maintained.

4,143,513

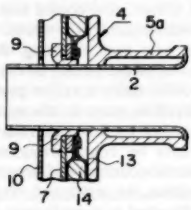
HEAT INSULATOR SUPPORT IN MANIFOLD REACTOR

Masami Konishi; Kazumasa Futamura, both of Toyota; Takashi Noda, Nagoya, and Nobutaka Morikawa, Aichi, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 5, 1976, Ser. No. 712,083

Int. Cl.² F01N *3/10*

U.S. Cl. 60—282 **4 Claims**



1. A heat insulator support for use in a manifold reactor of an engine, comprising:

at least one port liner communicating with an engine exhaust port;

a housing having an opening therein for receiving said port liner;

an outer core located inside said housing;

an inner core located inside said outer core;

a grommet having an opening for loosely holding said at least one port liner, said grommet being disposed between said housing and said outer core and having a deformed peripheral edge portion deformed upon assembly of said housing with said inner and outer cores and said grommet being arranged therein; and

a heat insulator filling a gap created by said deformed edge of said grommet deformed during assembly, said housing and said outer core.

4,143,514

MASTER BRAKE CYLINDER FOR TWO-CIRCUIT BRAKING SYSTEM

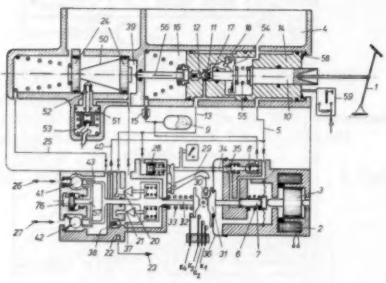
Heinz Leiber, Leimen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 9, 1976, Ser. No. 703,799

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1975, 2531264

Int. Cl.² B60T *17/22*

U.S. Cl. 60—534 **1 Claim**



1. In a master brake cylinder for a first and second brake circuit forming a two circuit braking system including a housing; a brake fluid reservoir; a brake fluid pressure source; an auxiliary piston having a pedal-actuated side and which together with the housing defines a first main cylinder; a control piston sliding within the auxiliary piston; a brake control valve means; and a second main cylinder and piston for the second brake circuit having a control chamber, the brake control valve means including a portion being actuated by the control piston for establishing fluid communication between the brake fluid pressure source and the first brake circuit and the control chamber of the second main cylinder, the portion of said brake control valve means being exposed to the pressure in the first brake circuit and the control piston having means for engaging and carrying along the auxiliary piston after a predetermined amount of axial travel, the improvement comprising,

auxiliary piston extension means for actuating said piston in said second main cylinder when said auxiliary piston and said control piston approach within a predetermined distance of said second main cylinder piston, wherein said auxiliary piston is exposed on the side remote from said pedal-actuated side to the pressure of the brake fluid pressure source, and wherein said portion of said brake control valve means is disposed within said auxiliary piston,

secondary piston means and pin means sliding therein, said secondary piston means being exposed to the pressure in said second main cylinder and varying the extension of said pin means into said second main cylinder by sliding displacement with respect to said secondary piston means and further including electric switch means actuated by the relative approach of said pin means and said secondary

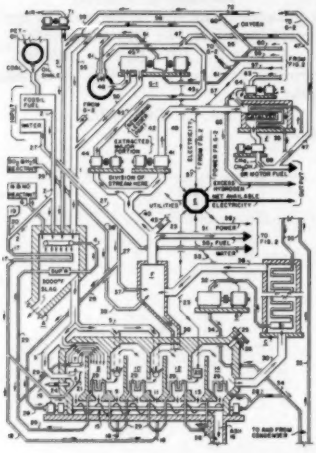
piston means and wherein said piston in said second main cylinder has a tapered wall capable of displacing said pin means relative to said secondary piston means, thereby actuating said switch means when insufficient pressure exists in said second main cylinder for causing said secondary piston means and said pin means to move away from said tapered surface.

4,143,515

CONVERTING FOSSIL FUEL AND LIBERATED WATER CONSTITUENTS TO ELECTRICAL ENERGY, SYNTHETIC NATURAL GAS OR MISCELLANEOUS HYDROCARBONS WHILE AVOIDING BEFOULMENT OF ENVIRONMENT

Carsten I. Johnsen, Sandvigen, Arendal, Norway

Filed Mar. 24, 1977, Ser. No. 781,013
Int. Cl.[2] F01K *23/00*
U.S. Cl. 60—648 **4 Claims**



1. A method for generating electrical energy while continuously producing a continuous stream of fuel gas consisting of principally hydrogen and carbon monoxide, made from oxidized fossil fuel and water constituents, in a process taking place in a closed circulatory system repeated over and over again indefinitely; a substantial excess portion of said fuel gas being of necessity continuously extracted from the unceasingly renewed stream to maintain its mass equilibrium and continuity of processing, the extracted portion diverted for manufacture of a line of hydrocarbons in quantity; said method effected in steps comprising:

1—injecting uninterruptedly coal or other fossil fuel in suspension by oxygen and superheated steam into a gasifing unit, producing therein a continuous stream of synthesis gas at elevated temperatures above the fusion point for ash, the thus liquified slag-ash to a cooling pool for disposal,

2—directing the hot synthesis gas stream issuing from the gasifier to a stream reconditioning enclosure denying air entry, divided internally into a plurality of chamber groups, each group having a heated chamber and a connected contiguous cooled chamber, the stream impelled to flow consecutively through the succession of connected chamber groups, upwardly in the heated chambers and downwardly in the cooled chambers, from entrance to exit of the enclosure,

3—heating the heated chambers by portions of the hot synthesis gas stream issuing from the gasifier and directed upwardly in the heated chambers, while the cooled chambers, enlarged in crossectional areas relatively to the crossectional area of the cooled chamber of the preceding chamber group, are cooled by cooling coils absorbing heat from descending hot streams when contacting said coils, thus cooling the streams and chambers,

4—inducing the stream to flow through the plurality of connected chamber groups to enclosure exit by said heating and cooling of the contiguous connected chambers; the relatively higher temperatures of the stream flowing upwardly in the heated chambers compared to the somewhat lower temperatures of the stream descending in the enlarged, cooled chambers, give rise to differing densities of the stream when inhabiting the two chambers, thereby developing a plurality of connection currents impelling the stream to advance to exit of the enclosure,

5—converting not-wanted carbon dioxide carried by the synthesis gas stream to carbon monoxide, the reaction involved effected by addition of oxidizable carbonaceous material, for example coke, to the hot synthesis gas portions when injected into the heated enclosure chambers, endothermic reactions between stream-contaminating-carbon dioxide and the carbon element in the said added carbonaceous material, results in carbon monoxide when in the presence of adequate heat at a temperature level above that required for effecting the said endothermic reaction, such heat being supplied by the hot synthesis gas-portions heating the heated chambers to elevated temperatures, the thus produced carbon monoxide joining and enriching the stream flowing through the stream reconditioning enclosure,

6—shedding of ash and other particles from the stream flowing through the enclosure is effected as a result of decreases in stream velocities taking place when stream descends in enlarged cooled chambers of the chamber groups, thereby shedding ash and other particles from the stream, each of the successive cooled chambers of the plurality of chamber groups being progressively enlarged in volume via increased crossectional areas, as the stream flows toward enclosure exit, the thus shedded ash particles being collected and ejected from the enclosure for disposal,

7 — recovering substantial heat energy values from the relatively hot stream issuing from the stream reconditioning enclosure after conversion activities therein, by passing the stream through a heat-exchanging steam boiler making steam for a heat engine driving an electric generator, generating electrical energy to a control unit for distribution to useful employment as may be desired; while the thereby cooled stream issues from the steam boiler; available for additional treatments including:

8 — ridding the stream of various not-wanted ingredients including unreacted steam and dust particles too small to be shedded in the manner of steps **5** and **6**, as well as hydrogen sulphide; elimination of these ingredients effected by scrubbing the stream with water jets, thus condensing the unreacted steam to water, wetting the fine dust to water-dust-droplets, while hydrogen sulphide, soluble in water, becomes sulphuric acid; the gaseous stream now carrying thus-treated-not-wanted-ingredients is passed through a rotating cyclone, old to the art, out-separating and ejecting from the stream the thus-treated-not-wanted ingredients for disposal,

9 — dividing the stream, now cooled and freed from several undesirable contaminants, in a stream division area into two unequal stream parts, it being obvious that due to continual renewal of the stream in the gasifier plus additions to it in other units; a major portion of the stream substantially equal in mass to the sum of the masses of ingredients absorbed by the stream during said processing must of necessity be continuously extracted from the stream of maintain continuity of processing in the closed circulatory system, the extracted major portion of the stream being diverted to manufacture of a line of hydrocarbons elsewhere,

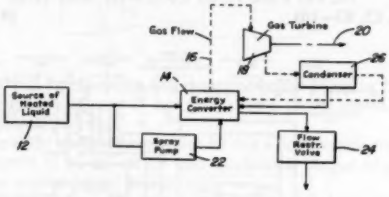
10 — directing the remaining lesser portion of the divided stream, together with adequate supplies of an oxidant, to

operative gas turbine-electric generator sets, generating electrical energy to the said electricity control unit for distribution as may be desired; while simultaneously

11 — augmenting the masses of the continuously renewed reactants making synthesis gas in said gasifying unit by adding the spent, quite hot, gas-turbine discharges to the gasifier, thereby closing a circuit of the closed circulatory system, repeated over and over again indefinitely if desired,

12 — resulting in generation of electrical energy for useful employment desired, while producing a continuous stream of fuel gas consisting of principally hydrogen and carbon monoxide available for uses desired, having their origin in fossil fuel, water constituents and oxidants.

4,143,516
AIR-WATER POWER GENERATOR
Aden B. Long, P. O. Box 221, Hamilton, Mont. 59840
Filed Oct. 25, 1977, Ser. No. 845,232
Int. Cl.[2] F01K *25/06*
U.S. Cl. 60—649 **26 Claims**



13. A method of converting heat energy in a liquid into kinetic energy of a gas, including the steps of: conducting said gas in heat exchange relation to the liquid to produce thermally induced flow of the gas; collecting the liquid within a volumetrically enlarged zone to establish a substantially static liquid evaporation surface; passing the gas in contact with said liquid evaporation surface to effect evaporation of the liquid to decrease the density of the gas; and accelerating the flow of the gas as a function of said decrease in density thereof.

4,143,517
THERMAL ENGINE
Elmer Compton, 6038 W. Catalina, Phoenix, Ariz. 85033
Filed Aug. 1, 1977, Ser. No. 820,840
Int. Cl.[2] F03G *3/00*; F01K *25/08*
U.S. Cl. 60—675 **11 Claims**

1. A thermal engine adapted to convert heat energy from a heat source to mechanical energy comprising:

(a) a power rotor including:

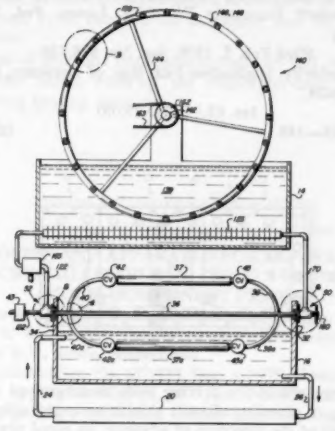
(i) a main shaft mounted for rotation;

(ii) at least one pair of vapor chambers disposed about said shaft and supported thereon, said vapor chambers having an inlet and an outlet;

(b) condenser means;

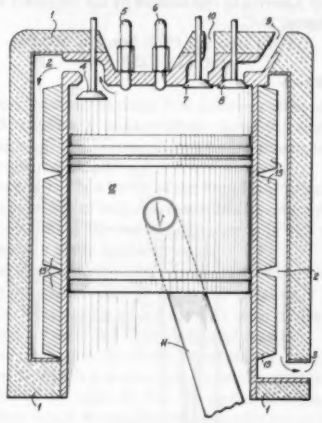
(c) conduit means connecting the inlet and the outlet of said vapor chambers to said condenser forming a closed loop containing a working fluid;

(d) check valve means associated with said conduit means permitting flow only from said outlet to said condenser and return to said inlet whereby the working fluid in a vapor chamber at a predetermined rotative position of the rotor is heated and vaporized by said heat source and



thereafter condensed and returned to the vapor chamber imparting rotation to said rotor.

4,143,518
INTERNAL COMBUSTION AND STEAM ENGINE
Ogden Kellogg-Smith, Rte. 4, Box 6, Arnold, Md. 21012
Continuation of Ser. No. 733,878, Oct. 19, 1976, abandoned.
This application May 22, 1978, Ser. No. 908,551
Int. Cl.[2] F01B *29/04*
U.S. Cl. 60—712 **9 Claims**



1. In a cyclic engine having at least one piston and cylinder provided with means for introducing and firing a fuel-air charge for a first power stroke, means for exhausting hot products of combustion from said cylinder and means for injecting steam/water into said cylinder for a second power stroke, the improvement comprising:

means defining a chamber surrounding said cylinder, said means for exhausting products of combustion from said cylinder being arranged to direct said products into said chamber;

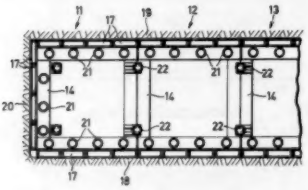
means for conducting heat from said products in said chamber to the inner surface of said cylinder, and

an exhaust passage from said chamber.

4,143,519
DRIVE SHIELD

Eberhard Unger, Lunen, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Feb. 7, 1978, Ser. No. 875,726
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1977, 2706024
Int. Cl.[2] E21D *19/00*
U.S. Cl. 405—145 **10 Claims**

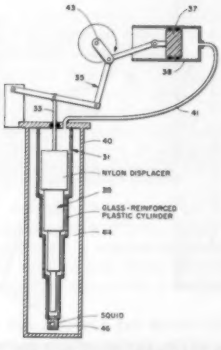


1. A drive shield for driving wide underground cavities, comprising: a plurality of knife shields arranged side-by-side transversely of the direction of advance, an equal plurality of support frames individually associated with the knife shields, each knife shield having a plurality of elongate knives displaceably mounted on a respective support frame, the elongate knives being advanceable relative to their support frame be means of hydraulic rams mounted on that support frame, wherein the support frames of each pair of adjacent knife shields are linked by connecting means which permit one of the support frames to be advanced relative to the other.

4,143,520
CRYOGENIC REFRIGERATION SYSTEM

James E. Zimmerman, Boulder, Colo., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 23, 1977, Ser. No. 863,840
Int. Cl.[2] F25B *9/00*
U.S. Cl. 62—6 **12 Claims**



1. A system for obtaining and maintaining low cryogenic temperatures in a low input power cyclic cryogenic refrigerator using the principle of the Stirling refrigeration cycle comprising:

a piston cylinder and a plastic piston mounted therein for prolonged reciprocating motion at low cryogenic temperatures;

a cascaded multistage displacer cylinder and a cascaded multistage displacer mounted therein in side wall tolerance therewith of substantially 0.005 to 0.002 cm;

a vacuum vessel containing said displacer cylinder and a vacuum in said vessel;

a conduit communicating between said piston cylinder and said displacer cylinder so as to provide a closed volume and a cryogenic fluid filling said volume;

means coupled to said piston and said displacer for providing cyclic operations thereof,

said tolerance and said displacer and displacer cylinder cooperating to provide substantially frictionless reciprocating motion of the displacer in the displacer cylinder and the necessary heat exchange therebetween to reduce the temperature at the remote end of said displacer of least diameter to values on the order of 8.5° K. to 13° K.,

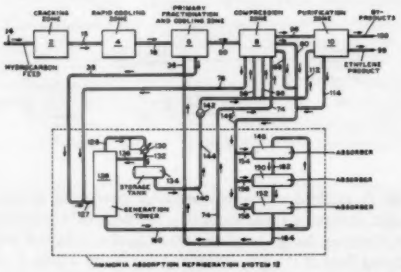
said tolerance achieved by shaping said displacer to substantially conform to said displacer cylinder at room temperature,

said displacer annealed by heating said displacer in said displacer cylinder and relaxed by subsequent cooling so that precise conformation between contacting surfaces thereof is obtained.

4,143,521
PROCESS FOR THE PRODUCTION OF ETHYLENE

Benjamin V. Pano, Watertown, and Sharad S. Gandhir, Newton, both of Mass., assignors to Stone & Webster Engineering Corporation, Boston, Mass.

Filed Feb. 8, 1977, Ser. No. 766,757
Int. Cl.[2] F25B *15/00*; C07C *3/00, 5/00, 11/02*
U.S. Cl. 62—101 **18 Claims**



1. In a process for thermally cracking hydrocarbons to produce olefins said process having a cracking zone, a rapid cooling zone, a primary fractionation and cooling zone, a compression zone and a purification zone wherein waste heat is released and cooling of system streams is effected, the improvement comprising the steps of:

heating a rich ammonia stream from an ammonia absorption refrigeration system with waste heat released from quench water in said primary fractionation and cooling zone and with low-level waste heat released from steam emanating from steam turbines in said compression zone, to generate an ammonia refrigerant in said ammonia absorption refrigeration system; and

cooling said system streams in said olefin production process with ammonia refrigerant generated in said ammonia absorption refrigeration system.

4,143,522
WINDMILL OPERATED SYSTEM

Joseph T. Hamrick, Roanoke, and Leslie C. Rose, Rocky Mount, both of Va., assignors to World Energy Systems, Fort Worth, Tex.

Filed Sep. 30, 1977, Ser. No. 838,203
Int. Cl.[2] F25B *13/00*
U.S. Cl. 62—324 **7 Claims**

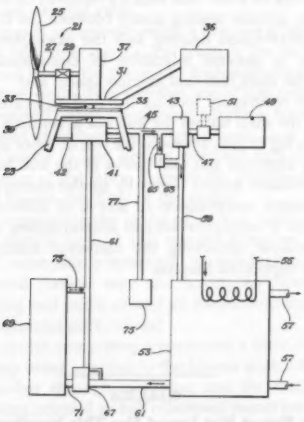
1. A system for extracting useful energy from the wind, comprising:

pump means having a fluid inlet and a fluid outlet,

fluid driven power means having a fluid inlet, a fluid outlet, and a mechanical output,

reservoir means for holding an operating fluid,

conduit means for providing fluid communication from said fluid outlet of said pump means to said fluid inlet of said fluid driven power means; from said fluid outlet of said fluid driven power means to said reservoir; and from said reservoir to said fluid inlet of said pump means,



a windmill for operating said pump means for pumping fluid from said reservoir to said fluid driven power means for operation thereof,

temperature conditioning means having a compressor means adapted to be driven by said mechanical output of said fluid driven power means, and

means coupled to said reservoir for utilizing the heat of said operating fluid in said reservoir and resulting in part from the inefficiency of said pump means and from said fluid driven power means.

4,143,523

APPARATUS TO TRANSFER HEAT OR REFRIGERANT

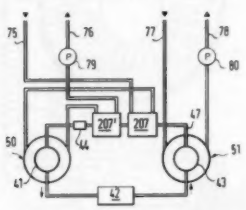
Manfred R. Bürger, Wolfratshauser Str. 45, 8023 Pullach; Ernst Gagel, Karwendelstrasse 49, 8000 Munich; Rudolf Kalmovicz, Stadtweg 25, 8059 Altenerding, and Alfred Prechtl, Lindenweg 6, 8082 Grafrath, all of Fed. Rep. of Germany

Division of Ser. No. 651,103, Jan. 21, 1976, Pat. No. 4,065,937. This application Oct. 25, 1977, Ser. No. 845,194

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1975, 2542728

Int. Cl.² F25B *13/00*

U.S. Cl. 62—324 **6 Claims**



1. A heat pump for the transfer of heat or refrigerant between two separate flows of fluid, comprising

(a) a refrigeration cycle including an evaporator, a compressor, a condensor and a regulating valve;

(b) the evaporator and condenser being adapted for heat exchange with either one of the respective separate flows of fluid for the transfer of heat and refrigerant from one fluid flow to the other;

(c) a counterflow cooler arranged in a conduit of the refrigeration cycle between the condenser and the regulating valve;

(d) one of said fluid flows passing through said counterflow cooler before entering the evaporator-heat exchanger during heating operation.

4,143,524

PROCESS AND APPARATUS FOR SEPARATING CRYSTALLIZABLE MATERIALS FROM A MULTI-COMPONENT SYSTEM

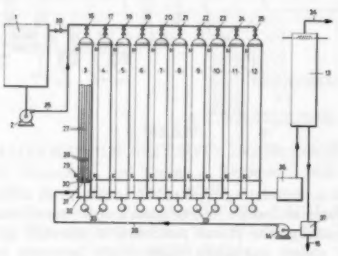
Henricus A. C. Thijssen, Son, Netherlands, assignor to Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel B.V., Joure, Netherlands

Continuation of Ser. No. 637,933, Dec. 5, 1975, abandoned. This application May 12, 1977, Ser. No. 796,388

Claims priority, application United Kingdom, Dec. 6, 1974, 52900/74

Int. Cl.² B01D *9/04*

U.S. Cl. 62—542 **2 Claims**



1. A process for concentrating fruit juice or coffee extract by freezing and recovering mother liquor thereby formed, comprising subjecting said system to batchwise treatment in the following sequential steps;

a. a first step wherein a batch of the liquid is confined at rest within a plurality of long, narrow tubes having dimensions so that maximum conductive distance is in the range of 5–25 mm of a static heat exchanger;

b. a second step in which heat is withdrawn from said batch so as to crystallize part of the water creating a substantially coherent matrix of ice crystals with mother liquor entrapped between the crystals in said matrix;

c. a third step wherein the matrix of crystals is released from the tubes to which it is attached by briefly supplying heat externally of the tubes so that the matrix of crystals with the mother liquor is expelled downwardly out of the heat exchanger;

d. a fourth step wherein the material expelled in step (c) is broken up by a disc at the lower extremity of the tubes to produce broken up material of a desired size, such as to permit separation of said broken up material in step (c) and leaving a portion of the crystal matrix within the tubes which is held within the tubes by the disc to plug the lower end of the tubes;

e. a fifth step in which the crystals in the mass obtained in step (d) are transferred to a wash column, therein separated from the mother liquor, and the mother liquor is recovered; and

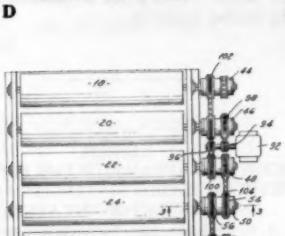
f. a sixth step in which the tubes are refilled with additional liquid.

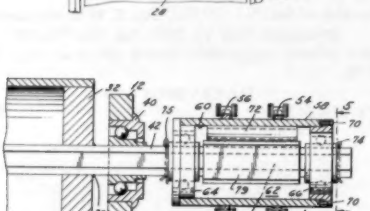
4,143,525

ACCUMULATING ROLL CONVEYOR

Harry Major, 612 Higbie Pl., Grosse Pointe Woods, Mich. 48236

Continuation-in-part of Ser. No. 686,364, May 14, 1976, abandoned. This application Feb. 8, 1978, Ser. No. 876,159
Int. Cl.² F16D 7/02
U.S. Cl. 64—30 D **5 Claims**





1. In an accumulating type roller conveyor in which a supporting frame includes a pair of spaced apart parallel longitudinally extending side frame members, a plurality of parallel conveyor rollers extending transversely between and journaled on the side frame members, a drive shaft for each of the rollers rigidly secured thereto for driving the same and each shaft having an end portion projecting co-axially from one end of its associated roller and outwardly beyond a common one of said side frame members and being of hexagonal external configuration, and a chain sprocket wheel journaled on said end portion of each shaft for rotation relative thereto;

the invention characterized in that each chain sprocket wheel is provided with a hub having an internal surface spaced radially outwardly from the shaft end portion providing a generally annular space therebetween;

a sleeve freely axially slidably but non-rotatably mounted on the shaft end portion and having an external circumferential surface opposed to said internal surface of the hub but spaced radially therefrom to define an annular space therebetween, one of said surfaces having one or more radially displaced portions projecting toward the opposed surface to provide one or more narrowed spaces between the opposed surfaces;

at least one resiliently compressible torque transmitting rollable element disposed in said annular space and serving to drivingly couple each sprocket wheel to its associated drive shaft and roller, each said torque transmitting element normally acting to transmit the rotation of its sprocket wheel to the end portion of the drive shaft through said sleeve with which it is associated as long as the resistant load applied to the associated roller and shaft does not exceed a predetermined limit, but when such load does exceed this limit the torque transmitting element is rollably squeezed past said one or more narrowed spaces thus automatically discontinuing the driving relationship between the sprocket wheel and the shaft until the resistant load imposed on such shaft falls below said limit whereupon the drive shaft is again drivingly coupled to the sprocket wheel;

the invention being further characterized in that a pair of sealed anti-friction bearings is received within opposite ends of each sprocket hub for journaling the same on the shaft end portion and defining axially opposite ends of the annular space in which the one or more torque transmitting elements are contained, each such anti-friction bearing having an inner race slidably received on the shaft end portion, annular sealing means between the inner race of each anti-friction bearing and the associated shaft end portion to prevent migration of contaminating media along the shaft into said annular space; and

means for removably locking the bearing nearer the outer end of the shaft within the hub but permitting removal of the bearing to gain access to the one or more torque transmitting elements and said sleeve in the hub for replacing such elements and/or sleeve by similar elements of different resilient compression or sleeve of different external diameter or configuration and accomplishing such operation without disturbing the conveyor rollers and any articles supported thereon.

4,143,526

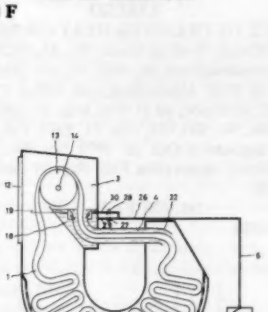
Patent Not Issued For This Number

4,143,527

APPARATUS FOR THE WET TREATMENT OF FABRICS

Isidro F. Trullás, Tarrasa, Spain, assignor to Argelich, Termes Y Cia., S.A., Tarrasa, Spain

Filed Nov. 28, 1977, Ser. No. 855,135
Claims priority, application Spain, Apr. 28, 1977, 458.257
Int. Cl.² D06B 3/28
U.S. Cl. 68—18 F **5 Claims**



1. In apparatus for the wet treatment of fabrics, of the type in which the fabric is driven in rope form through an enclosed,

pressurised or unpressurised vessel, in a fast outgoing path through a transport duct and a further slow return path through a storage chamber which contains at any time the major portion of the fabric rope being treated and in which there are in combination a circuit for the fabric and a further circuit for the treatment liquor, the improvement comprising the combination of:

(a) a storage chamber of tubular construction having a generally U shape with a semicircular center section and first and second vertical arms;

(b) winch means positioned within a first one of said vertical arms for providing mechanical traction for the fabric;

(c) combined means for the mixed hydraulic traction of the fabric positioned within said first one of said vertical arms, said combined means comprising overflow means and jet means, said combined means being positioned above the level of liquor in said storage chamber sufficiently high that transfer of the fabric through the combined means is effected by the overflow of the liquor;

(d) a duct connecting the outlet of said jet means with said second vertical arm of said storage chamber, said duct having a substantially horizontal portion between said first and second vertical arms and having an elbow portion connecting said outlet of said jet means with said substantially horizontal portion; and

(e) a bath circuit comprising a pump and a filter, the inlet of said pump being coupled to the lowest point of said storage chamber through said filter and the outlet of said pump being coupled to said combined means for hydraulic traction, said filter having a removable lid, and said filter being positioned vertically with said removable lid being above the level of liquor in said storage chamber, said level of liquor being sufficiently low that the fabric will not float in said liquor.

4,143,528

ANTI-THEFT LOCKING DEVICES

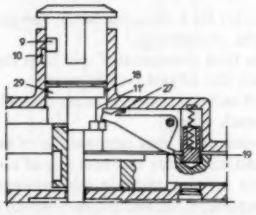
Günter Weber, Wuppertal, and Günter Schaumburg, Radevormwald, both of Fed. Rep. of Germany, assignors to Neiman S.A., Courbevoie, France

Filed Sep. 26, 1977, Ser. No. 836,824

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1976, 2644312

Int. Cl.[2] E05B *15/00, 63/00*

U.S. Cl. 70—1.5 **12 Claims**



1. A device for locking the locking bolt of a cylinder lock in its locked position when an unauthorised removal of the locking cylinder is effected, comprising

(a) a lever which rests against a portion of the locking cylinder and which is movable from a first to a second position upon the removal of the locking cylinder;

(b) a locking piece movable between an unlocking and locking position in engagement with an aperture formed in said locking bolt and

(c) spring means for urging said locking piece in the direction of the locking position, said locking piece being held in a cocked state in the unlocking position by the lever in one position thereof with the leading face of same locking piece resting against a surface at the end of the lever that is opposite to the cylinder lock and being released when the lever has been moved by said locking cylinder to the second position.

4,143,529

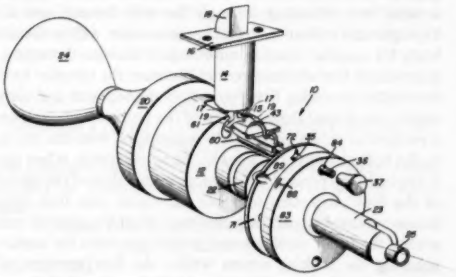
TAMPERPROOF SECURITY DOOR LOCK

Houston H. Brummett, and Norma J. Brummett, both of 5074 Conifer Dr., Bremerton, Wash. 98310

Continuation-in-part of Ser. No. 707,814, Jul. 22, 1976, abandoned. This application May 10, 1977, Ser. No. 795,654

Int. Cl.[2] E05B *55/14*

U.S. Cl. 70—152 **9 Claims**



1. In a locking device having a latch connected to a plunger for displacement therewith and a retractor in operative engagement with said plunger to force movement of said plunger and said latch, and a turning mechanism operatively engaged with said retractor to force movement thereof, the improvement comprising:

a latch locking member having an elongated longitudinal

dimension for disposition in an opposing relation to said plunger for blocking movement of said plunger;

a retractor blocking member having an elongated longitudinal dimension connected transversely to said longitudinal dimension of said latch blocking member for blocking movement of said retractor; and

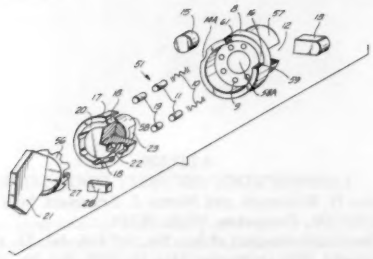
handle means disposed exteriorly of the locking device and being operably engaged with said latch blocking member and said retractor blocking member for allowing displacement of said latch blocking member and said retractor blocking member, the handle means being adapted to be grasped and displaced by a user, thereby displacing the latch blocking member and the retractor blocking member relative to the plunger and the retractor.

4,143,530

LOCKABLE GAS CAP ASSEMBLIES

Sezhaidin M. Murtezov, and Dzhihan S. Murtezov, both of Sevlievo, Bulgaria, assignors to NOP "Technologia Na Metalite", Sofia, Bulgaria

Filed Jan. 21, 1977, Ser. No. 760,987
Claims priority, application Bulgaria, Jan. 20, 1976, 32114
Int. Cl.[2] B65D *55/14*
U.S. Cl. 70—165 **4 Claims**



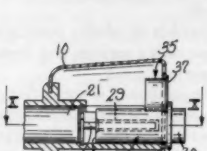
1. In a lockable gas cap assembly, an outer hollow shell having a first circular central aperture; an inner hollow shell having a second inwardly cusped central aperture and adapted for attachment to a filler tube for a gas tank; cylindrical locking means comprising a front hollow body having adjacent front and rear portions, the front portion of the hollow body having a radial slot extending through the wall thereof, and a rear, key-operated cylindrical tumbler receivable within the hollow body for angular rotation with respect thereto through a predetermined first circumferential distance, the tumbler having a forwardly extending first projection aligned with and disposed within the slotted front portion of the hollow body and having a peripheral recess normally in registration with the radial slot in the hollow body, the tumbler being rotatable, when the key is operated, to present the unrecessed portion of the periphery of the first projection opposite the radial slot; first retaining means removably carrying the inner shell for coaxial rotation within the outer shell; second retaining means for removably securing the locking means within the first aperture of the outer sleeve, the inwardly cusped peripheral wall of the second aperture of the inner shell surrounding the slotted forward portion of the hollow body of the locking means when the locking means and inner shell are retained within the outer shell; and an elongated follower member adapted for radial sliding movement in the radial slot in the hollow body between the periphery of the underlying first projection of the tumbler and the overlying cusped peripheral wall of the inner shell, whereby when the key is operated the unrecessed portion of the projection of the tumbler urges the follower member against the surrounding peripheral wall of the inner shell to be restrained against rotation by the cusp.

4,143,531

DISPOSABLE CORE FOR LOCK CYLINDER

Alfred E. Floyd, North Guilford, Conn., assignor to Walter Kidde & Company, Inc., Clifton, N.J.

Filed Dec. 28, 1977, Ser. No. 865,227
Int. Cl.[2] E05B *15/00*
U.S. Cl. 70—367 **8 Claims**



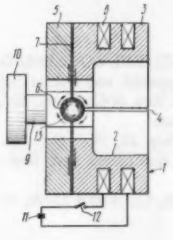
1. A disposable plug assembly for use in place of the core of a removable core lockset having a figure-8 shaped core cylinder cavity and latch actuating core engaging means in the lower portion of said cavity, the plug assembly comprising a main plastic cylindrical element having inner and outer ends and adapted to have a friction fit in said lower portion, said element having its inner end shaped to engage the core engaging means, and its outer end being solid and provided with means for engagement by an operating device for rotation of said element and actuation of a latch.

4,143,532

INDUCTOR FOR FORMING METALS BY THE PRESSURE OF A PULSED MAGNETIC FIELD

Lev T. Khimenko, p/o Pokotilovka, ulitsa Ulyanovskaya, 35; Alexandr T. Mezhuev, ulitsa Sverdlova, 152 "A", kv.59; Anatoly V. Legeza, p/o Merefa, ulitsa Sportivnaya, 29; Andrei K. Sljusarev, ulitsa Rybalko, 21/15, kv.21; Anatoly D. Gavrjuschenko, ulitsa Vorovskogo, 22, all of Kharkov; Vyacheslav A. Chudakov, ulitsa Anri-Barbjusa, 22, kv.48, Kiev, and Mikhail I. Baranov, ulitsa Galana, 3, kv.30, Kharkov, all of U.S.S.R.

Filed Nov. 2, 1977, Ser. No. 847,858
Int. Cl.[2] B21D *26/02*
U.S. Cl. 72—56 **7 Claims**



1. An inductor for forming metals by the pressure of a pulsed magnetic field, comprising:

a magnetic field concentrator split in at least one plane;

at least two dies of said concentrator;

said dies of said concentrator being spatially adjustable relative to each other;

a coil located on at least one said die of said concentrator;

said coil inducing eddy currents in said concentrator;

at least one opening made in said concentrator, having an axis extending along said plane in which said concentrator is split and said axis being perpendicular to the longitudinal axis of said magnetic field concentrator;

a surface of said opening, concentrated whereon are eddy currents inducing eddy currents in a workpiece;

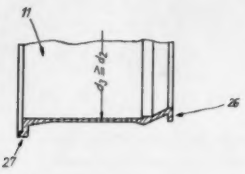
a means for electrically insulating said dies of said concentrator.

4,143,533

METHOD OF MANUFACTURING SOLID WHEEL RIMS

Walter Bosch, Ostfildern, Fed. Rep. of Germany, assignor to Bohner & Kohle GmbH & Co., Esslingen, Fed. Rep. of Germany

Filed Jun. 1, 1977, Ser. No. 802,453
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1976, 2624872
Int. Cl.[2] B21D *53/30*
U.S. Cl. 72—68 9 Claims



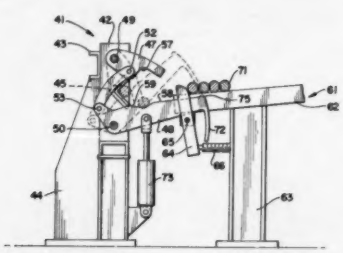
1. A method of manufacturing a solid wheel rim, for example for trucks or lorries, having a wheel-rim flange at one end of a wheel-rim base and a spring-ring groove at an opposite end of the base, from a rolled and longitudinally welded sheet-metal ring of a predetermined inner diameter shaped to a predetermined section shape and having a reduced wall thickness over at least part of its length, comprising the steps of radially expanding a portion of said ring during a rounding operation to produce an annular groove zone having an inner diameter substantially equal to said predetermined inner diameter, an enlarged zone having an inner diameter greater than said predetermined inner diameter, and a tapered zone located between said annular groove and enlarged zones, reducing the wall thickness of said ring during a pressing operation by subjecting each of said zones to a predetermined pressure, shaping said ring at said annular groove zone by means of a rolling operation to form said spring-ring groove, and shaping said ring at said one end by means of a rolling operation to form said wheel-rim flange.

4,143,534

WORKPIECE FEED CHANNEL

Heinz Hartkopf, Solingen, and Horst Schneider, Witzhelden, both of Fed. Rep. of Germany, assignors to Th. Kieserling & Albrecht, Solingen, Fed. Rep. of Germany

Filed Aug. 19, 1977, Ser. No. 826,205
Int. Cl.[2] B21D *3/04*
U.S. Cl. 72—98 5 Claims



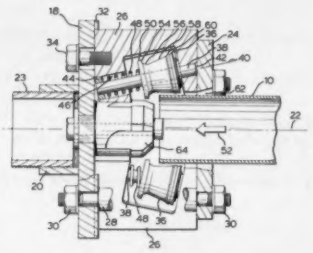
1. A feed channel for elongated workpieces comprising: a plurality of longitudinally spaced adjustable workpiece receiving openings, each said opening being formed by a fixed segment and at least one movable segment which is movable between open and closed positions for respectively exposing said openings to lateral introduction of workpieces thereinto and closing said openings, opposed straightening rolls which are opposed in a predetermined direction lying in a plane, and said fixed segment being profiled and positioned for supporting workpieces of varying diameters with the longitudinal axes of such workpieces lying substantially in said plane even though such axes are spaced varying distances from the bottom of said fixed segment, and positioned to define a side segment and is generally V-shaped, said plane being generally horizontal and said straightening rolls being horizontally opposed.

4,143,535

PIPE END SHAPER

Willem J. Bouman, Toronto, Canada, assignor to Automatic Sprinkler Limited, Mississauga, Canada

Filed Feb. 21, 1978, Ser. No. 879,705
Int. Cl.[2] B21D *17/04*
U.S. Cl. 72—119 13 Claims



1. Apparatus for performing an operation upon an end of a workpiece comprising:

means mounting a tool for rotation about a mounting axis along which the workpiece is moved in an engaging direction for engagement with the tool,

said mounting means mounting the tool for longitudinal movement along a tool axis inclined toward the mounting axis in the said engaging direction of movement of the workpiece,

the tool being engagable with the workpiece upon the said movement thereof in the engaging direction, and being moved along the inwardly-inclined tool axis with the workpiece,

whereby the movement of the workpiece in the engaging direction is accompanied by movement of the tool toward the mounting axis to engage it with the workpiece for it to perform an operation thereon.

4,143,536

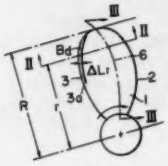
METHOD OF CORRECTING ROTATIONAL SPEED OF SCREW PROPELLER

Hiroshi Okamoto, and Shigetomo Matsui, both of Kobe, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Oct. 30, 1975, Ser. No. 627,464
Int. Cl.[2] B21K *3/00*
U.S. Cl. 72—342 1 Claim

1. A method of correcting the rotational speed of a screw propeller having a blade (1) which has a back side (5), a face side (4), and a trailing edge (3) of an outline (3*a*), which method comprises locally heating the blade on one of the back and face sides (5), (4) along a plurality of paths substantially parallel to the outline (3*a*) and at an average distance ΔLR inward therefrom, while at the same time locally cooling the blade on the other side along said paths, and naturally cooling the parts thus locally heated thereby to form wash-back of a magnitude Wr in the region of the blade between the trailing edge and the heating paths as a result of angular deformation accompanying

plastic deformation due to the heating and cooling and thereby to vary the effective pitch of the propeller, the blade being thus locally heated on the back side (5) when it is desired to decrease the effective pitch thereby to increase the rotational speed of the propeller, the blade being thus locally heated on the face side (4) when it is desired to increase the effective pitch thereby to decrease the rotational speed, said blade being distorted for correcting the rotational speed of said screw propeller, said heating and cooling steps being carried out



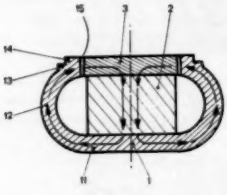
along a plurality of paths substantially parallel to the outline of the trailing edge of the blade, said heating and cooling steps comprising differential heating along said paths at a predetermined distance inward from the outline of said trailing edge to be displaced by a predetermined distance, said blade being locally heated by weld depositing weld beads along said paths, the parts of the beads projecting above the blade surface being subsequently machined off, and the blade surface being smoothly finished to a fair curve surface.

4,143,537

METHOD FOR THE MANUFACTURE OF LOUD SPEAKERS

Jean-Jacques M. Ribatto, Rue du Marechal Foch, Vaux le Penil (Seine & Marne), France

Continuation-in-part of Ser. No. 699,868, Jun. 25, 1976, abandoned. This application Jan. 23, 1978, Ser. No. 871,688
Claims priority, application France, Jun. 27, 1975, 75 20339
Int. Cl.[2] B21D *22/00*
U.S. Cl. 72—356 **1 Claim**



1. A method of manufacturing the pot of a loud speaker comprising the steps of:

a. forming a circular metallic blank;

b. pressing the blank to raise the walls forming a minor concavity around the central base;

c. pressing the concave blank into a cone with slightly diverging sides while forming an angle on the diameter of the sides of which angle are to form the interior diameter and the top of the pot, respectively;

d. pressing the top portion of the walls inwardly to form the annular opening with a vertical wall, said vertical wall being one of the sides of said angle, the other side of said angle forming the top of said pot;

e. pressing the recessed ring in the neck which cooperates with the protective cover of the loud speaker;

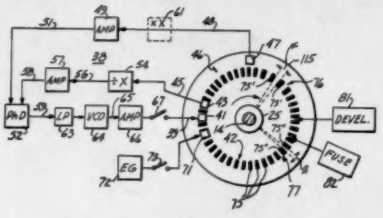
f. gauging the interior diameter and height and flattening the base.

4,143,538

METHODS AND APPARATUS FOR MANUFACTURING TACHOMETERS

Herbert Karsh, Laguna Beach, and J. Clyde Norton, Van Nuys, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Continuation-in-part of Ser. No. 669,062, Mar. 22, 1976, abandoned. This application Dec. 15, 1977, Ser. No. 860,812
Int. Cl.[2] G01C *25/00*
U.S. Cl. 73—2 **22 Claims**



1. In a method of manufacturing a tachometer of a type having annularly arranged tachometer markings on a rotary tachometer device, the improvement comprising in combination the steps of:

rotating said tachometer device;

generating a signal having recurring signal portions of providing said markings upon recordation on said rotary tachometer device;

adapting the number of said signal portions occurring in said signal during a revolution of said rotating tachometer device to a whole number of tachometer markings accommodable on said tachometer device in a continuous circular array; and

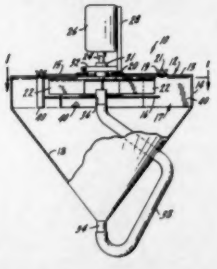
providing on said tachometer device tachometer markings in a continuous circular array by recording said signal having said adapted number of signal portions onto said rotating tachometer device in a continuous circular array.

4,143,539

APPARATUS AND METHOD FOR DETERMINING THE ATTRITION PROPERTIES OF A MASS OF SOLID PARTICLES

Lloyd A. Baillie, Homewood, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 660,207, Feb. 23, 1976, Pat. No. 4,081,249. This application Mar. 16, 1978, Ser. No. 887,409
Int. Cl.[2] G01N *3/56*
U.S. Cl. 73—7 **13 Claims**



1. An apparatus useful in determining the time rate of attrition of a mass of solid particles comprising:

(1) chamber means defined by substantially opposing first and second end walls and a sidewall;

(2) inlet means located in said chamber means to provide for entrance of said solid particles into said chamber means;

(3) outlet means located in association with said chamber means to provide for withdrawing said solid particles from said chamber means;

(4) conduit means providing communication between said inlet means and said outlet means to allow solid particles withdrawn from said chamber means in said outlet means to be reintroduced into said chamber means through said inlet means;

(5) impeller means located within said chamber means to urge said solid particles from said inlet means in the general direction of said sidewall of said chamber means; and

(6) motor means in communication with said impeller means to provide for rotation of said impeller means.

4,143,540

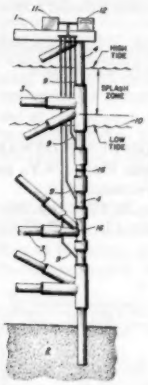
METHOD OF PREVENTING CORROSION OF JOINTS OF STEEL STRUCTURES SUBMERGED IN CORROSIVE MEDIA

Marvin L. Peterson, and Donald H. Oertle, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Dec. 27, 1977, Ser. No. 864,574

Int. Cl.[2] G01M *3/14*; G01N *33/20*

U.S. Cl. 73—40 **9 Claims**



1. A method for protecting a critical area of a structural member subject to stress corrosion, and corrosion fatigue comprising,

(a) placing a fluid impermeable covering over the critical area;

(b) providing a fluid passageway and fluid communication from the permeable covering to a vacuum source and to a pressure sensor; (c) sealing the foregoing from the external environment and reducing the pressure in the now sealed system below ambient (pressure); and (d) monitoring the pressure in the system with the pressure sensor such that subsequent penetration of the covering allows entrance of fluid from the environment and is detected by the pressure sensor, indicating a loss of protection afforded by the covering.

4,143,541

METHOD AND DEVICE FOR MEASURING THE CHARACTERISTICS OF PLASTIC FLUID AND CONTROL SYSTEM FOR POURING THE SAME INTO MOULDS

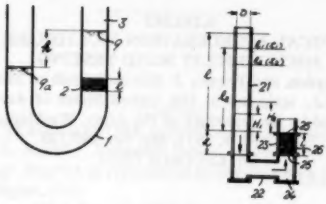
Yasuro Ito, No. 4-38-16 Numabukuro, Nakano-ku, Tokyo, Japan; Hideharu Kaga, Tokyo, Japan; Yasuhiro Yamamoto, Kawasaki, Japan; Tadayuki Sumita, Tokyo, Japan; Kuniomi Suzuki, Tokyo, Japan; Kenji Kuroha, Tokyo, Japan; Takakazu Ishii, Tokyo, Japan, and Mitsutaka Hayakawa, Kamakura, Japan, assignors to Yasuro Ito and Taisei Corporation, both of Tokyo, Japan

Filed Jan. 28, 1977, Ser. No. 763,664

Claims priority, application Japan, Jan. 27, 1976, 51-7132; Dec. 28, 1976, 51-157452

Int. Cl.[2] G01N *11/08*

U.S. Cl. 73—55 **30 Claims**



1. A method for measuring the fluidity of a plastic fluid showing the characteristics of a Bingham Fluid System which requires an initial shear stress yielding pressure to cause it to flow, comprising the steps of providing an element defining a flow passage through which said fluid is passed which manifests a resistance to the flow of said plastic fluid, passing said plastic fluid through said flow passage, and measuring the pressure necessary to cause said plastic fluid to flow through said flow passage for determining the relative flow coefficients of said plastic fluid with respect to said flow passage, said coefficients being the relative initial shear stress yielding value, the relative closure coefficient and the relative flow viscosity coefficient.

4,143,542

TENSION INDICATOR FOR SCREW CONNECTIONS

Eugen Gotter, Düsseldorf, Fed. Rep. of Germany, assignor to Hoffmann Werke, J. Oswald Hoffmann GmbH, Lintorf, Fed. Rep. of Germany

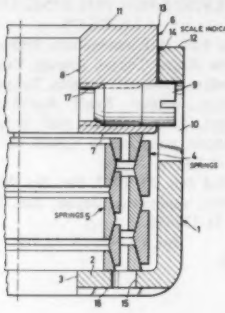
Filed Dec. 29, 1977, Ser. No. 865,518

Int. Cl.[2] G01L *5/00*

U.S. Cl. 73—761 **1 Claim**

1. An indicator for the tension to which a bolt of a screw connection is subjected, comprising a housing having a hollow cylindrical wall and a bottom a disc slidingly disposed within said housing, said bottom and said disc each having a coaxial bore, compression spring means comprising two coaxially disposed annular spring piles disposed within said housing between said bottom and said disc, said bottom having at least

one aperture to vent an annular space between said two piles, and means to indicate the relative position of said disc within



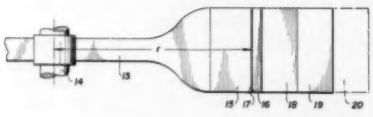
said housing upon the indicator being subjected to a force directed to compress said spring means.

4,143,543

MECHANICAL ACCELERATION MULTIPLIER FOR MICROCIRCUIT BOND TESTING

Owen P. Layden, and Francis J. Murdoch, both of Monmouth Beach, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 9, 1977, Ser. No. 849,735
Int. Cl.[2] G01N *19/04*
U.S. Cl. 73—827 **5 Claims**



1. A mechanical acceleration device for testing the bond strength of an adhesive comprising, a shaft rotatable about a central axis, a rotary arm secured to and extending radially from said shaft, an adhesive layer to be tested disposed on the outer peripheral end of said arm and extending parallel to said axis, a component bonded to said outer end of said arm by said adhesive layer and extending parallel to said axis, whereby upon rotation of said arm a pulling force is imparted by said component to said adhesive layer in an outwardly radial direction.

4,143,544

FINGERPRINTING CRYSTALS

Robert C. DeVries, Burnt Hills, and Roy E. Tuft, Guilderland Center, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 22, 1977, Ser. No. 809,004
Int. Cl.[2] G01N *19/08*
U.S. Cl. 73—104 **10 Claims**

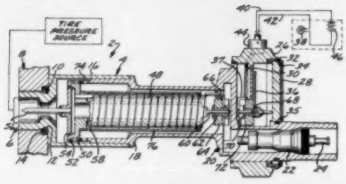
1. A process for characterizing a crystal selected from the group consisting of natural diamond, synthetic diamond and cubic boron nitride, said crystal containing at least a significant amount of structural growth discontinuities caused by fluctuations in the conditions contacting the growing crystal which comprises providing said crystal with at least one external surface having a surface area of at least 0.1 square millimeter which is at least substantially smooth and without significant elevational differences and which intersects at least a portion of said growth discontinuities, electrostatically charging said crystal so that at least said smooth surface of said crystal is electrostatically charged, applying a powder to said charged surface forming a powder pattern on said charged surface, said powder having a particle size ranging from submicron to about 45 microns, said pattern being a delineation of said intersected growth discontinuities.

4,143,545

PRESSURE GAUGE ASSEMBLY

Abdul N. Sitabkhan, Arcadia, Calif., assignor to HTL Industries, Inc., Pasadena, Calif.

Filed Jan. 3, 1978, Ser. No. 866,371
Int. Cl.[2] B60C *23/04*; G01L *7/04*
U.S. Cl. 73—146.8 **30 Claims**



1. A combination pressure indicator and valve assembly for aircraft tires comprising;

means for attachment of the assembly to a wheel mounting member;

sensor means for sensing a pressure differential in fluidic contact with the pressurized fluid in the tire;

a secondary source of pressure operatively connected to the sensor means having substantially the same pressure temperature response characteristic as the fluid in the tire;

indicator output means responsive to the sensor means for providing an output representation of a predetermined pressure differential between the secondary source of pressure and the tire pressure,

valve means for providing fluidic access to the interior of the tire, and

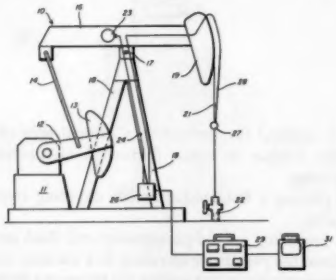
means for compensating for volumetric changes in the tire volume during normal operation.

4,143,546

SUCKER ROD PUMP DYNAMOMETER

Robert P. Wiener, White Plains, N.Y., assignor to Litton Systems, Inc., Mount Vernon, N.Y.

Filed Jan. 23, 1978, Ser. No. 871,428
Int. Cl.[2] E21B *47/00*
U.S. Cl. 73—151 **6 Claims**



1. An instrument for use with a sucker rod pump comprising a walking beam driven by a motor and a wire line suspended from a horsehead, the instrument comprising in combination:

first means for measuring the stroke of the wire line,

second means for measuring the load on the wire line,

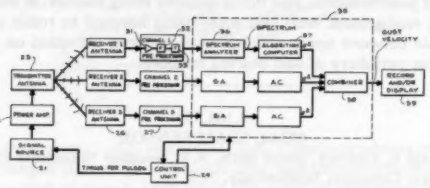
a first meter for indicating the maximum load on the pump,

a second meter for indicating the minimum load on the pump,
a third meter for indicating the stroke of the pump, and
third means for indicating the work which is performed by the pump.

4,143,547
METHOD AND APPARATUS FOR REMOTE MEASUREMENT OF VARIATION IN WIND VELOCITY

Martin Balser, Los Angeles County, Calif., assignor to Xonics, Inc., Van Nuys, Calif.

Filed May 8, 1978, Ser. No. 903,481
Int. Cl.[2] G01S 9/66
U.S. Cl. 73—170 R **16 Claims**

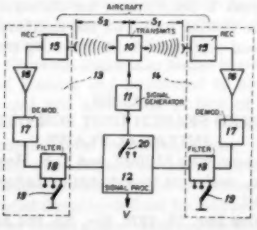


1. In a system for measuring variations in velocity of wind at a specific location, the combination of:
an acoustic echo system transmitter for directing a beam of acoustic energy toward a zone spaced from said transmitter;
a plurality of receivers for said transmitter and spaced from each other, with each receiver directed toward said zone for receiving acoustic energy of said transmitter scattered in said zone and providing a receiver output signal having a doppler frequency component;
a spectrum analyzer for each receiver output and providing as an output a spectrum of the receiver output signal averaged over a first time period; and
first means for calculating the second moment of each of said spectra for generating an output signal for each spectrum as a measure of the variation in each component of the velocity of the wind at said zone in a second time period substantially shorter than said first time period.

4,143,548
MEASURING THE SPEED OF AN AIRCRAFT

Eberhard Graewe, Achim-Bierden, and Siegfried Krajeweski, Stuhr, both of Fed. Rep. of Germany, assignors to Vereinigte Flugtechnische Werke-Fokker GmbH, Bremen, Fed. Rep. of Germany

Filed Oct. 26, 1977, Ser. No. 845,583
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1976, 2648693
Int. Cl.[2] G01P 5/00; G01F 1/66
U.S. Cl. 73—181 **3 Claims**

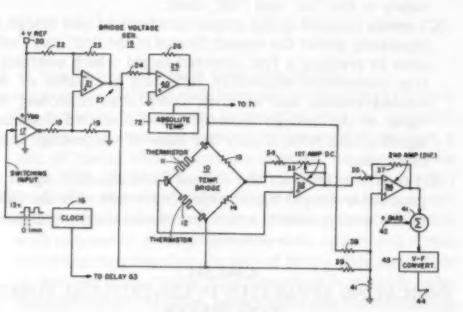


1. A system for measuring the speed of an aircraft having a longitudinal axis, comprising:
an ultrasonic transmitter on the aircraft including means for continuously transmitting ultrasonic waves at least in two oppositely oriented directions along the longitudinal axis of the aircraft;
means included in the transmitter for providing frequency modulation by at least one modulation frequency having a particular wavelength so that said ultrasonic signals as transmitted are frequency modulated by said modulation frequency;
a pair of ultrasonic receivers respectively disposed to intercept the waves as transmitted by the transmitter in the said two opposite directions, said receivers being spaced from the transmitter by distances smaller than said wavelength;
means included in the receivers for demodulating the signals as detected by the receivers; and
means for determining the phases of demodulation signals as produced by the means for demodulating and for determining the speed of the aircraft on the basis of the determined phases.

4,143,549
TEMPERATURE MEASURING SYSTEM

Richard L. Koehler, Falmouth, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 27, 1978, Ser. No. 873,027
Int. Cl.[2] G01K 7/22
U.S. Cl. 73—342 **10 Claims**



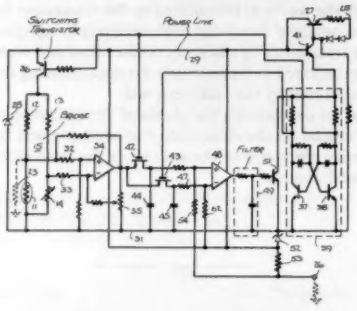
1. Apparatus for use in determining the temperature gradient within a fluid medium, comprising in combination
a differential Wheatstone bridge having a thermistor in a pair of its arms,
said bridge being positioned within said fluid medium such that said thermistors sense the temperatures at two spaced locations;
means for energizing said bridge with a DC voltage of a predetermined magnitude and of a polarity which is different during alternate equal time intervals;
means for converting the DC output signal from said bridge into a signal whose frequency varies in accordance with the magnitude of said DC output signal; and
means for indicating the difference in the number of cycles of the variable frequency signal that is produced by said last-mentioned converting means during a consecutive pair of said equal time intervals,
said difference being indicative of the difference in the temperatures at said two locations and being unaffected by any changes in the magnitude of the DC voltage energizing said bridge.

4,143,550

RESISTANCE-TO-CURRENT CONVERTER

Tamotsu Kobayashi, Yokohama, Japan, assignor to Hokushin Electric Works, Ltd., Tokyo, Japan

Filed Mar. 20, 1978, Ser. No. 888,468
Claims priority, application Japan, Mar. 22, 1977, 52/31437
Int. Cl.[2] G01K *7/24*
U.S. Cl. 73—362 AR **5 Claims**



1. A resistance-to-current converter for producing an output signal that accurately reflects the value of a sensing resistor that is subject to leakage resistance, said converter comprising:

(A) a resistance bridge, one arm of which is formed by said sensing resistor, said bridge having input and output junctions;

(B) switching means interposed between a power supply and the input junctions of said bridge to periodically supply an excitation voltage thereto whereby said bridge is alternately in the "on" and "off" state;

(C) means coupled to the output junctions of said bridge to separately detect the output thereof in the "on" and "off" state to produce a first detected signal which contains a true component accurately reflecting the value of the sensing resistor and an error component reflecting the value of the leakage resistance, and a second detecting signal which reflects only the value of the leakage resistance; and

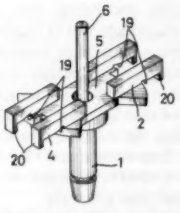
(D) means to subtract the second from the first signal to produce an output signal which represents only the value of the sensing resistor and is free of said error component.

4,143,551

INDICATING APPARATUS IN CENTRIFUGAL FORCE TYPE METER

Nobuyuki Onitsuka, Miyazaki, Japan, assignor to Kabushiki Kaisha Honda Rokku, Miyazaki, Japan

Filed Oct. 21, 1977, Ser. No. 844,264
Claims priority, application Japan, Oct. 23, 1976, 51-143364[U]; Feb. 23, 1977, 52-22051[U]
Int. Cl.[2] G01P *3/18*
U.S. Cl. 73—535 **1 Claim**



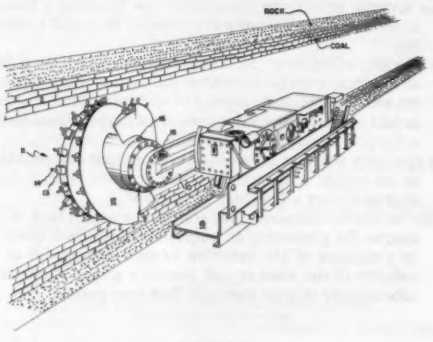
1. An indicating apparatus in a centrifugal force type meter employing weight members each having arcuately shaped peripheral surfaces and being radially directed to rotate with a driving shaft for transmission to a thrust member disposed in the axial direction thereof; said driving shaft being provided with weight guiding member means having flat upper surfaces adjacent said shaft and lower surfaces spaced from said shaft, said weight members having surfaces engaging said guiding member surfaces, to thereby guide said weight member in a radial direction and preventing the vertical movement thereof; pointer means disposed in relation to a scale responsive of said thrust member wherein: said thrust member being formed as a tubular body having an opening portion in the central axial direction thereof; and said pointer means being provided with a turning shaft formed into a screw shaft being turned by engagement with a narrowed portion of said tubular body at the opening portion thereof and bearing means being provided with a bayonet connection for receiving said screw shaft of said pointer means, said thrust member being inserted in working engagement with said scale being adapted to retain said scale between upper and lower projections provided on the outer periphery of said bearing member.

4,143,552

COAL SEAM SENSOR

David E. Godfrey, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 1, 1978, Ser. No. 882,412
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—579 **4 Claims**



1. A horizon control sensor for a coal mining machine having at least one support arm on which is mounted a rotatable cutting tool, comprising:

at least one vibration transducer mounted on the support arm to sense the sonic vibrations of the rotatable cutting tool and generate an electrical signal representative thereof,

filter means for extracting from said vibration signal at least one narrow band of frequencies at and near a preselected resonant frequency of the cutting tool, and

signal processing means for deriving from an extracted resonant peak a discriminant for distinguishing engagement of the cutting tool with the interface between coal and rock and other coal seam enclosing materials.

4,143,553

CONTOURED SEARCH UNIT FOR DETECTING INTERNAL FLAWS

George D. Martens, New Milford, and T. B. Hendricks, Bethel, both of Conn., assignors to Automation Industries, Inc., Los Angeles, Calif.

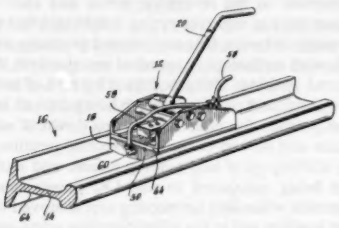
Filed Dec. 19, 1977, Ser. No. 861,841
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—625 **15 Claims**

1. An ultrasonic search unit for detection of internal flaws in an elongated workpiece having a curved contour by sliding

said shoe in a single pass along the length of said workpiece, said search unit comprising:

a shoe with a base surface dimensioned to span the workpiece and conforming generally to the contour of the workpiece, said shoe being adapted to be slid along the length of said workpiece; and

a plurality of transducers for transmitting ultrasonic signals into said workpiece and for receiving signals reflected



from within said workpiece, said transducers being arranged in an array across said shoe, said transducers being angled relative to each other, the angles of said transducers being set such that the signals transmitted by said transducers are refracted at the interface between said shoe and said workpiece and the refracted signals continue through said workpiece more nearly parallel to each other.

4,143,554

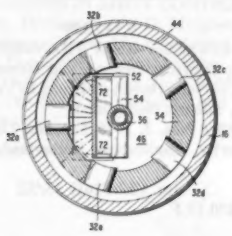
ULTRASONIC SCANNER

Art Nagy, Santa Monica, and Andrew P. Proudian, Chatsworth, both of Calif., assignors to Second Foundation, Woodland Hills, Calif.

Continuation-in-part of Ser. No. 777,146, Mar. 14, 1977, abandoned. This application Sep. 14, 1977, Ser. No. 833,244

Int. Cl.[2] G01N *79/04*

U.S. Cl. 73—641 **33 Claims**



29. An ultrasonic scanner comprising:

a housing;

partial reflector means positioned within said housing, said partial reflector means having a reflectivity substantially less than that of a perfect reflector;

one or more ultrasonic transducer means moveably mounted within said housing and positioned to direct ultrasonic waves toward and across the surface of said reflector means; and

means for causing said transducer means to traverse an arcuate path with respect to said reflector means, said reflector means positioned closer to said transducer means than the radial distance defined by said arcuate path, and said reflector means angled with respect to said ultrasonic waves, whereby said ultrasonic waves scan across said partial reflector means and are partially reflected to converge at a point a preselected distance in front of said reflector means.

4,143,555

DUAL BAND PUSHBUTTON TUNER

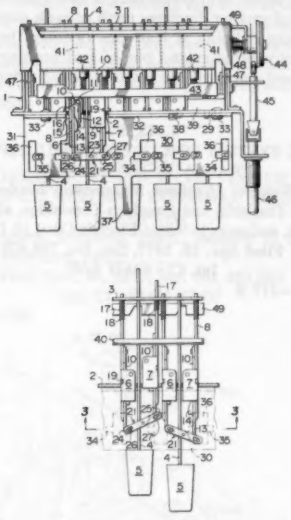
Tamaki Ohashi, Tokyo, Japan, assignor to Nihon Technical Kabushiki Kaisha, Japan

Filed Nov. 10, 1976, Ser. No. 740,747

Claims priority, application Japan, Nov. 13, 1975, 50-135717; Jul. 19, 1976, 51-85160; Aug. 20, 1976, 51-98649

Int. Cl.[2] F16H *35/18*

U.S. Cl. 74—10.33 **13 Claims**



1. A dual band pushbutton tuner comprising:

a support, a pushbutton slide mounted on the support so as to be movable between its inoperative and its operative position and normally urged to its inoperative position, a pair of tuning slide assemblies disposed on the opposite sides of the pushbutton slide and mounted on the support so as to be movable independently of each other between their inoperative and operative positions in conjunction with movement of the pushbutton slide, connecting means for connecting together the pair of tuning slide assemblies so that one of the tuning slide assemblies is movable independently from the other, means mounting the connecting means for pivotal movement on the pushbutton slide, and means coacting with the connecting means for selectively constraining one of the pair of tuning slide assemblies while enabling independent movement of the other.

4,143,556

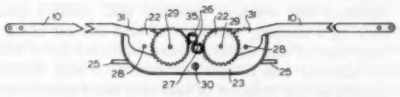
MOTORIZED VENT OPERATOR

Peter F. Hauber, 7846 Shady Spring Dr., Burbank, Calif. 91504

Filed Feb. 16, 1978, Ser. No. 878,407

Int. Cl.[2] F16H *21/16;* E05F *11/00, 11/24, 11/36*

U.S. Cl. 74—25 **5 Claims**



1. A vent operator comprising:

a housing comprising foward and rear portions;

a plurality of shafts, said housing mounting said shafts be-

tween said forward and rear portions in generally parallel relationship;

a driven spur gear on one of said shafts;

an idler spur gear on a second of said shafts in meshing contact with said driven gear;

two outer spur gears on respective shafts, each having a set of outer teeth and a concentric spur gear including a set of smaller diameter teeth, the outer teeth of one outer gear meshing with said driven spur gear and the outer teeth of the other outer gear meshing with said idler gear; and

two sector arms, each mounted on respective shafts, one end of each sector arm comprising a spur gear meshing with the set of smaller diameter teeth of each outer spur gear;

said housing defining at least one opening through which said sector arms extend out of said housing for arcuate movement responsive to rotation of said driven spur gear.

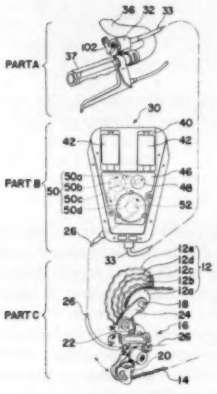
4,143,557
CONTROL SYSTEM FOR USE IN A MULTIPLE SPEED TRANSMISSION SYSTEM

Yoshitaka Wakebe; Hirofumi Matsumoto; Hiedo Momohara; Yasuyuki Tsuchida, and Kazuhiro Tomoshige, all of Moriguchi, Japan, assignors to Sanyo Electric Co., Ltd, Osaka, Japan

Filed Apr. 18, 1977, Ser. No. 788,679

Int. Cl.[2] F16H *9/00*

U.S. Cl. 74—217 B **26 Claims**



1. A control system for use in a multiple speed transmission system having a power transmission mechanism defining a power delivery path between driving member means and driven member means for controlling the relative motion between said driving member means and driven member means, said power transmission mechanism having a plurality of coaxially aligned transmission gears provided in said power delivery path and each transmission gear having a different diameter, an endless chain for engaging said delivery path with one of said transmission gears and guiding means for guiding said endless chain to engage with one of said transmission gears and to change the instantaneous power to be transmitted through the transmission mechanism with respect to changes of the transmission gear to be engaged with said endless chain, said control system comprising:

(a) a shifting means including a reversible motor, a winding reel connected to said motor, a flexible wire connected between the winding reel and said guiding means for making a shifting operation of said endless chain during operation of said shifting means, upon receipt of either one of advance and retreat movement of said flexible wire caused by the rotation of said reversible motor, an urging means connected to said guiding means for shifting-down said guiding means upon a winding up operation of said flexible wire onto said reel during the rotation of the motor in one direction and shifting-up said guiding means upon paying out operation of said flexible wire from said reel by the pulling force of said urging means during the rotation of said motor in the other direction;

(b) a source of DC electric power;

(c) a switch means including a first switch unit having a main terminal electrically connected to said reversible motor, a plurality of selective terminals and a connecting arm member for selectively connecting one of said selective terminals with said main terminal and a second switch unit connected to the reversible motor and also to the DC power source, said connecting arm in said first switch unit movable between first and second positions and engageable with said selective terminal one at a time, the first and second positions being occupied by two of said selective terminals, said connecting arm being moved towards the first position for effecting shifting-down of said guiding means and moved towards the second position for effecting shifting-up of said guiding means, said second switch unit being connected to said DC power source in one direction when said connecting arm is moved towards the first position and in the other direction when said connecting arm is moved towards the second position;

(d) a plate member mechanically connected to said reversible motor, said motor moving said plate member between an initial position and a terminated position in relation to the rotation of said reversible motor;

(e) an actuator member, electrically connected to said second switch unit, provided on said plate member;

(f) a plurality of actuating members, each electrically connected to said selective terminal in said first switch unit, each of said actuating members provided adjacent to said plate member for actuating said actuating member as said actuator member moves past said actuating member, whereby, upon manually turning on said switch means to connect said main terminal with one of said selective terminals through said connecting arm, said power source provides electric power to said shifting means through said switch means for operating said shifting means until said actuator member has moved past said actuating member for disconnecting said shifting means from said power source.

4,143,558
VARIABLE-V-BELT TRANSMISSION

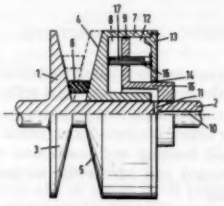
Petrus H. van Deursen, Deurne, and Hemmo H. J. Ludoph, Heeze, both of Netherlands, assignors to Van Doorne's Transmissie B.V., Tilburg, Netherlands

Filed Nov. 3, 1976, Ser. No. 738,592

Claims priority, application Netherlands, Nov. 6, 1975, 7513019

Int. Cl.[2] F16H *55/52*

U.S. Cl. 74—230.17 F **2 Claims**



1. A stepless variable transmission having an endless transmission means and at least a V-shaped pulley of which at least one side plate is fixedly connected to a hydraulic cylinder-piston unit for axially moving said side plate, the cylinder-piston unit being provided with a pressure compensation chamber for compensating pressure increases in the cylinder space as a result of centrifugal forces, an axial bore extending between the cylinder space and the compensation chamber, and means

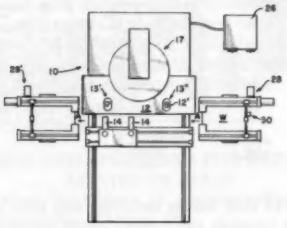
for supplying pressure fluid from the cylinder space through a filler hole to the compensation chamber and for shutting off the filler hole dependent on the distance between the pulley side plates, said means including a control member axially movable through said bore, said control member having a channel in communication with the cylinder space and with said filler hole so that at a preselected axial position of said control member said filler hole will be blocked by the wall of said axial bore.

4,143,559

TEXTILE APRON AND METHOD OF MAKING SAME

Roger D. Meadows, Waynesville, and John C. Duckett, Clyde, both of N.C., assignors to Dayco Corporation, Dayton, Ohio

Filed Oct. 31, 1977, Ser. No. 846,879
Int. Cl.[2] F16G *1/00*; B29D *17/00*; B29H *7/22*
U.S. Cl. 74—231 R **20 Claims**



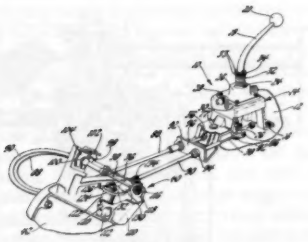
1. A textile apron adapted to be operated in an endless path, said apron comprising polymeric matrix material having a plurality of discrete reinforcing fibers randomly disposed therethrough in a substantially uniform manner and defining the sole reinforcing means of said apron, said substantially uniform disposal providing uniform reinforcement of said apron at each cross-sectional position thereof across its width which assures precise wobble-free tracking during operation of said apron in an associated drive system.

4,143,560

TRANSMISSION SHIFT CONTROL

Charles E. Kinkade, Dryden; Robert O. Morgner, Lake Orion, and Harold L. Sharp, Farmington, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 19, 1977, Ser. No. 843,559
Int. Cl.[2] G05G *9/16*; F16H *57/06*
U.S. Cl. 74—473 R **3 Claims**



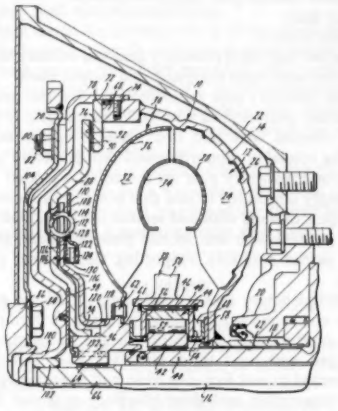
1. In a control mechanism for a transmission having a casing enclosing gear means, the combination comprising a housing, a cradle member swingingly mounted in said housing and having a slot formed across the bottom thereof, a shift control lever swivably mounted at an intermediate portion thereof in said housing and having the lower end portion thereof extended through said slot, a link pivotally mounted in said housing and having one end thereof pivotally connected to said cradle member for movement therewith, a shaft extending through said casing and operatively connected to said gear means for establishing a selected gear ratio in said transmission, a first lever pivotally mounted on said casing and pivotally connected to said shaft for axially moving said shaft into and out of said casing, a second lever secured to said shaft for rotating said shaft, a first flexible cable connected between the other end of said link and said first lever for selectively axially moving said shaft to one of a predetermined number of axial positions in response to movement of said shift control lever and said cradle member, and a second flexible cable connected between the lower end of said shift control lever and said second lever for selectively rotating said shaft in one direction into one of a predetermined number of positions, or in the other direction into one of a predetermined number of positions, depending upon the axial setting of said shaft in response to movements of said shift control lever along said slot in said cradle member.

4,143,561

HYDROKINETIC TORQUE CONVERTER WITH LOCK-UP CLUTCH AND INTERNAL VIBRATION DAMPING

Barry J. Melhorn, Westland, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 14, 1977, Ser. No. 851,002
Int. Cl.[2] F16H *47/00*
U.S. Cl. 74—730 **6 Claims**



1. A hydrokinetic torque transmitting mechanism comprising a bladed impeller and a bladed turbine situated in toroidal fluid flow relationship, the impeller being adapted to be connected to a source of torque such as an internal combustion engine, multiple ratio gearing, an output element of said gearing being connected to driven portions of said mechanism, a torque input element of said gearing being adapted to be connected to said turbine, a mechanical torque delivery path arranged in parallel disposition with respect to the hydrokinetic torque delivery path defined by said impeller and said turbine including a friction clutch selectively engageable to establish and disestablish said mechanical torque delivery path, said torque delivery path being defined in part by a vibration cushioning and dampening mechanism having a torque input element and a torque output element, a spring connection between said torque input element and said torque output element, said torque input element and said torque output element being adapted for limited relative angular displacement therebetween, said spring connection resisting said relative displacement, a damper spring carried by one of said elements of said cushioning and dampening mechanism, friction surfaces carried by said torque input and torque output elements and arranged in juxtaposed face-to-face relationship, said damper

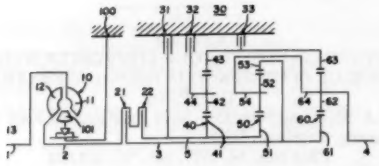
spring being adapted to apply an engaging force to said friction surfaces thereby establishing tangential damping forces upon relative displacement of said torque input element and said torque output element.

4,143,562

SPEED CHANGE GEAR

Noboru Murakami, Nagoya; Koichiro Hirosawa, Kariya; Kazuo Ohara, and Koichi Matsuo, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Division of Ser. No. 440,545, Feb. 7, 1974, Pat. No. 3,946,622.
This application Feb. 2, 1976, Ser. No. 654,374
Claims priority, application Japan, Feb. 26, 1973, 48-22832; Apr. 28, 1973, 48-48901
Int. Cl.[2] F16H *57/10*
U.S. Cl. 74—753 **11 Claims**



1. A speed change gear which comprises:
an input shaft;
an output shaft;
first, second and third planetary gear sets suitably interposed between said input shaft and said output shaft;
said first planetary gear set including a first sun gear, a first planetary gear meshed with said first sun gear, a first ring gear meshed with said first planetary gear, and a first carrier rotatably supporting said first planetary gear;
said second planetary gear set including a second sun gear drivingly connected to said first sun gear, a second planetary gear meshed with said second sun gear, a second ring gear meshed with said second planetary gear, and a second carrier rotatably supporting said second planetary gear;
said third planetary gear set including a third sun gear drivingly connected to said second ring gear, a third planetary gear meshed with said third sun gear, a third ring gear engaged with said third planetary gear and drivingly connected to said first ring gear, and a third carrier rotatably supporting said third planetary gear and drivingly connected to said second carrier and to said output shaft;
clutch means for selectively coupling said second ring and said third sun gear, and said first and second sun gears to said input shaft; and
brake means actuatable for selective engagement with said first and second sun gears, said first carrier, and said first and third ring gears to said casing.

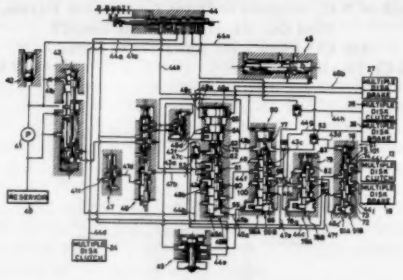
4,143,563

HYDRAULIC CONTROL SYSTEM FOR USE IN AUTOMATIC TRANSMISSION

Yoshio Shindo, and Hiroshi Ito, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 17, 1977, Ser. No. 825,374
Claims priority, application Japan, Mar. 1, 1977, 52/20828
Int. Cl.[2] B60K *41/04*
U.S. Cl. 74—867 **7 Claims**

1. A hydraulic control system for use in an automatic transmission of a vehicle with an internal combustion engine having a throttle, said transmission including a fluid type converter and a gear system provided with a plurality of frictional engaging means for deriving a plurality of speed ratios through said transmission, said system comprising:
a hydraulic fluid pressure source;
a line pressure control valve for generating in said system a regulated line pressure from said hydraulic fluid pressure source;
a throttle pressure control valve responsive to the setting of said throttle for generating in said system a throttle pressure determined by the position of said throttle;
a governor pressure control valve responsive to the speed of said vehicle for generating in said system a governor pressure commensurate with the vehicle speed;
a manual valve for manually changing the fluid path through said control system to enable setting of a predetermined transmission operating condition;



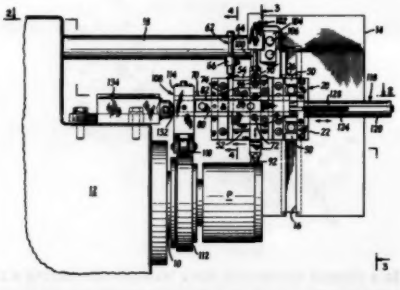
a plurality of shift valves including one shift valve designated to establish the highest speed condition for said transmission, said shift valves operating to control the path of fluid pressure supplied to said frictional engaging means, thereby to control operation of said frictional engaging means in accordance with a balancing of the relationship between said throttle pressure and said governor pressure; and
highest speed control means for shifting to a low-speed side position said one shift valve designated to establish the highest speed condition irrespective of the level of said governor pressure.

4,143,564

APPARATUS FOR SIMULTANEOUSLY FORMING SELECTED CIRCUMFERENTIAL AND AXIAL PROFILES ON A WORKPIECE

Richard L. DeBiasse, Chatham Township, Morris County, N.J., assignor to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Jun. 6, 1977, Ser. No. 803,685
Int. Cl.[2] B23B *5/24, 3/28*
U.S. Cl. 82—19 **8 Claims**



1. Apparatus for simultaneously forming a selected circumferential profile and a selected axial profile on a workpiece mounted for rotation about a fixed axis comprising a carrier mounted for movement toward and away from the workpiece and carrying a cutting element for engagement with the workpiece; means for yieldably pushing the carrier toward the

workpiece to engage the cutting element therewith for work thereon; means for moving the carrier along an axis parallel to the axis of rotation of the workpiece; an elongated cam follower bar mounted on the carrier for movement relative thereto solely along an axis parallel to and spaced from the axis of rotation of the workpiece; a circumferential cam mounted for rotation conjointly with the workpiece about the axis of rotation of the workpiece and having a circumferential cam surface matching the circumferential profile to be formed on the workpiece; an axial cam mounted on the follower bar and having an axial cam surfce matching the axial profile to be formed on the workpiece; a circumferential cam follower engaging the circumferential cam surface and interposed between the circumferential cam and the follower bar; means for controlling any movement of the follower bar along its axis relative to the circumferential cam; and an axial cam follower engaging the axial cam surface and interposed in series with the circumferential cam follower between the axial cam and the cutting element such that the cutting element tracks the axial cam and the axial profile is superimposed on the circumferential profile in the movement of the cutting tool parallel to the workpiece thereby to form the axial profile on the workpiece simultaneously with the circumferential profile.

4,143,565

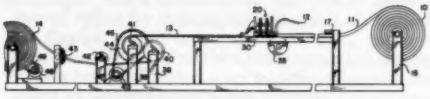
METHOD AND APPARATUS FOR REPAIRING CONVEYOR BELTS

Robert L. Larson, Des Plaines, Ill., assignor to Regis Belt Maintenance Corporation, Chicago, Ill.

Division of Ser. No. 650,497, Jan. 19, 1976, Pat. No. 4,064,775. This application Oct. 25, 1977, Ser. No. 844,746

Int. Cl.[2] B26D *3/28*

U.S. Cl. 83—4 **3 Claims**



1. An apparatus for removing the worn upper surface of a conveyor belt prior to the resurfacing thereof, comprising, a frame bed, a feeder roll for feeding the worn belt at a constant high tension over said frame bed, a takeup reel for receiving the stripped belt;

a stripping means positioned fixedly relative to the travel of said belt, said belt being fed past said stripping means to said take-up reel, for the splitting of said worn belt into two portions thereof, a discard belt portion and a remaining structural belt portion;

said stripping means comprising a stationary elongated knife edge and a knife edge support, and said knife edge support including an H-beam, cross-bar attached to a lower end of said H-beam, a stop on a side of said H-beam for assuring immobility of said stripping means in a direction parallel to the movement of said conveyor belt;

said knife edge support being vertically adjustable and mounted on said frame bed to allow the passage of said remaining belt portion between said knife edge support and said frame bed, said knife edge support rigidly engaging said knife edge so that the vertical adjustment of said knife edge support may present the stationary knife edge at various selected heights relative to an oncoming worn belt;

a first positioning means mounted on said frame bed for initial contact and orientation of said worn belt to a desired height and attitude;

a second positioning mounted to an underside of said frame bed for presenting said worn belt to said knife edge without substantial friction and in a continual and undeviating manner, relative to said knife edge, while allowing freedom of movement of said worn belt between said knife edge and said second positioning means;

a tensioning means for tensioning said belt between said first and second positioning means whereby said stationary knife edge strips a worn discard portion from said conveyor belt, presenting a new surface on the remaining portion of said conveyor belt, said remaining portion being of uniform thickness.

4,143,566

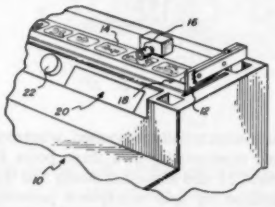
SEMIAUTOMATIC STRIP FEED CONTROL

Francis M. Laciak, Brooklyn Park, and Gerald R. Strunc, Maple Grove, both of Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed Jan. 9, 1978, Ser. No. 868,034

Int. Cl.[2] B65H *17/06*; B26D *7/00*

U.S. Cl. 83—42 **20 Claims**



1. A strip feed system comprising:

strip feed means for feeding a strip along a path in response to feed control signals and strip position adjust signals;

strip feed control means for providing feed control signals which result in a strip feed of a predetermined feed length;

operator control means for providing strip position adjust signals indicative of desired adjustments in the position of the strip along the path; and

feed length determining means for determining the predetermined feed length for a succeeding strip feed cycle from the predetermined feed length and the desired adjustments in position from a preceding strip feed cycle.

4,143,567

APPARATUS FOR KEEPING OPEN THE GAP CUT BY A SAW IN A WORKPIECE

Gerhard Kaiser, Metzingen, and Erich Spieth, Gomaringen, both of Fed. Rep. of Germany, assignors to Gustav Wagner Maschinenfabrik, Reutlingen, Fed. Rep. of Germany

Filed Sep. 12, 1977, Ser. No. 832,746

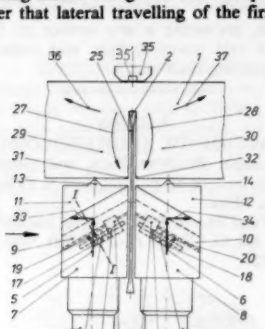
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1976, 2641255

Int. Cl.[2] B26D *7/08, 7/12*

U.S. Cl. 83—113 **12 Claims**

1. An apparatus for keeping open the gap (25) cut in a workpiece (1) having a substantial thickness in the cutting direction, by a saw blade forming said gap in the workpiece, comprising fixed abutment means (35) arranged on one side of a workpiece, said fixed abutment means being substantially centrally aligned with said saw blade, first chucking means arranged substantially opposite said fixed abutment means and spaced to one side of said saw blade, second chucking means (12) also arranged substantially opposite said fixed abutment means and laterally spaced from said first chucking means on the other side of said saw blade to form a saw blade gap between the first and second chucking means, respective guide means operatively supporting said first and second chucking means for gliding movement, power drive means operatively connected to said first and second chucking means for advancing and pressing said first and second chucking means toward said abutment means, each of said first and second chucking means comprising a workpiece facing side and workpiece penetrating means on said workpiece facing side, said apparatus further

comprising spring means operatively connected to said first and second chucking means for biasing the respective chucking means against said lateral gliding movement, said workpiece penetrating means biting into the workpiece surface in such a manner that lateral travelling of the first and second



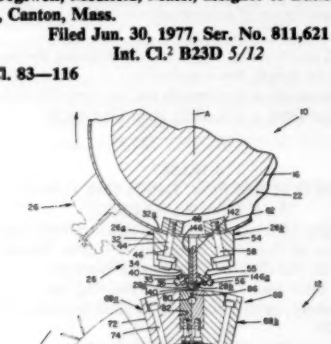
chucking means is substantially prevented, whereby said workpiece is clamped substantially in a three point fashion, one point being formed by said abutment means and the other two points being formed by said workpiece penetrating means whereby forces applied to the workpiece by said first and second chucking means keep said sawing gap open.

4,143,568

ROTARY WEB CUTTING APPARATUS

John Cogswell, Medfield, Mass., assignor to Butler-Automatic, Inc., Canton, Mass.

Filed Jun. 30, 1977, Ser. No. 811,621
Int. Cl.[2] B23D 5/12
U.S. Cl. 83—116 **7 Claims**



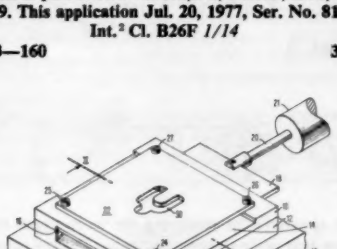
1. A rotary web cutting apparatus comprising
A. supporting structure for machine parts,
B. a knife cylinder,
C. means for mounting at least one knife assembly including a pair of closely spaced knife blades on the knife cylinder for cutting transverse strips from web,
D. an anvil cylinder,
E. means defining at least one anvil surface on the anvil cylinder,
F. means for rotatively mounting the two cylinders parallel to one another on said structure so that they are spaced apart to form a nip between them,
G. means for rotating the cylinders in opposite directions so that each knife blade passing through the nip interferes with an anvil surface, and
H. means for removing said strips from the vicinity of said blades, said removing means including
(1) a lengthwise series of projections mounted on one of said cylinders, said projections projecting through the plane defined by the cutting edges of the blade pair when the blade pair is in the nip between the two cylinders so tht the projections impale web strips cut by said blade pair,
(2) means defining a lengthwise series of recesses on the other cylinder disposed opposite said projections when the projections are in the nip between the two cylinders, said recesses being arranged to receive the portion of the projections extending through the web strips, and
(3) means mounted on said one cylinder adjacent said projections for pushing said strips off said projections at a location out of the nip between the two cylinders.

4,143,569

DIE HOLDER FOR PUNCH PRESSES

Joseph Marconi, 428 S. Jensen Rd., Vestal, N.Y. 13850

Continuation-in-part of Ser. No. 660,271, Feb. 23, 1976, Pat. No. 4,085,639. This application Jul. 20, 1977, Ser. No. 817,149
Int.[2] Cl. B26F 1/14
U.S. Cl. 83—160 **3 Claims**



1. In combination with a die set having a top plate with a punch secured thereto and a bottom plate, a die holder assembly adapted to be placed on said bottom plate, said die holder assembly comprising:
a die block;
a die retainer frame, said frame having spaced outer portions of a first thickness with connecting webs of a second reduced thickness extending between said outer portions, said outer portions and said webs defining an opening in said frame, walls of at least a portion of said opening being of a third thickness less than said first and second thicknesses;
a thin die plate positioned in said opening, said die plate being of said third thickness;
a sliding support member reciprocable between said die plate and said die block;
support pads for supporting said die plate on said die block, said support pads supporting said die plate above said die block at a height substantially equal to the thickness of said sliding support member; and,
a stripper plate above said die, said stripper plate and said frame being secured to said block.

4,143,570

FEEDING AND CUTTING CONTROL MECHANISM FOR ROLL STORED PAPER

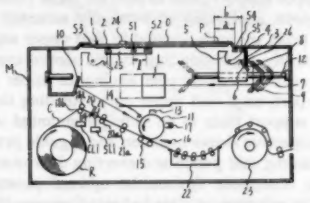
Hirohisa Fujimoto; Norihiko Suzuki, both of Toyokawa; Kenji Shibazaki, Aichi, and Kenichi Arai, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 17, 1977, Ser. No. 797,896

Claims priority, application Japan, May 25, 1976, 51-67313[U]

Int. Cl.² B26D 5/20

U.S. Cl. 83—205 7 Claims



1. In a feeding and cutting control mechanism for roll storage paper comprising:

means for feeding the paper drawn from said roll storage along a predetermined path;

clutch means transferrable between engage and disengage conditions for actuating and deactuating said feeding means;

cutting means disposed along said path for cutting said paper and including a single cycle rotatable cutter;

cutter rotating means for rotating said cutter a single revolution;

transmission means intercoupling said clutch means and cutting means for disengaging said clutch means during the rotation of said cutter, said paper being cut by said cutter rotated by said cutter rotating means and said paper feeding being terminated when said clutch means is disengaged by said transmission means during a single revolution of said single revolutional cutter, and termination of said paper feed occurring momentarily after said cutting of said paper, said transmission means including a timing member synchronously rotatable with said cutter and a deactuating means actuatable by said timing member, said deactuating means disengaging said clutch means when actuated by said timing means during a single rotation of said cutter and momentarily following the cutting of said paper.

4,143,571

ASSEMBLIES FOR WORKPIECE POSITIONING

John Oxenham, Newbury, England, assignor to Blackman Martin Group Limited, Swindon, Wiltshire, England

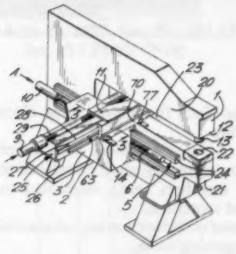
Filed Apr. 25, 1977, Ser. No. 790,556

Claims priority, application United Kingdom, Apr. 26, 1976, 16800/76

Int. Cl.² B26F 1/02

U.S. Cl. 83—412 3 Claims

1. A punch press comprising a C-shaped frame having an upper limb and a lower limb defining a throat therebetween, a first traverse on the frame and extending in a direction parallel to the throat, said first traverse including two parallel vertically-spaced rails secured to the lower limb of the frame, said rails extending forwardly and rearwardly from the back of the throat to enable a maximum throat depth to be employed during punching and said rails being vertically-spaced by a distance sufficient to provide a bearing area extending over a major portion of the height of the lower limb of the frame to ensure maximum rigidity, a second elongate traverse including a bearing slide and two parallel vertically-spaced tracks, said bearing slide being disposed intermediate the ends of the second elongate traverse, said bearing slide being engaged upon the two parallel vertically-spaced rails of the first traverse thereby supporting the second elongate traverse only intermediate its ends, and said bearing slide extending rearwardly of the second elongate traverse so as to engage with the rearwardly extending portions of the rails of the first traverse to enable the second elongate traverse to be withdrawn to the back of the throat, a workpiece support mounted on the two parallel vertically-spaced tracks of the said second elongate traverse, a first driven leadscrew in driving connection with said second traverse for moving the second traverse along the



two vertically-spaced rails of the first traverse in a direction perpendicular to the axis of the second traverse, said first driven leadscrew extending parallel to the two vertically-spaced rails of the first traverse, and said first driven leadscrew being disposed substantially centrally between the two rails of first traverse to aid in balancing the bearing forces acting upon the two rails, and a second driven leadscrew in driving connection with the said workpiece support for moving the workpiece support along the second traverse, said second driven leadscrew extending parallel to the two vertically spaced tracks of the second traverse.

4,143,572

CONTACTING OVERLAPPED CUTTING DISCS

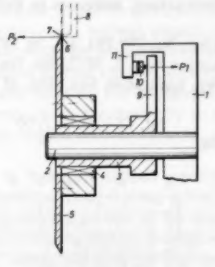
Herbert Schönmeier, Düsseldorf, Fed. Rep. of Germany, assignor to Jagenberg-Werke AG, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 20, 1977, Ser. No. 817,279

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1976, 2633340

Int. Cl.² B26D 1/24

U.S. Cl. 83—501 1 Claim

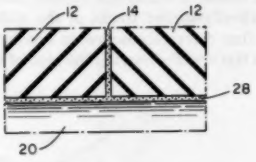


1. A cutting device comprising a pair of circular blades, one of which blades is in the form of an elastic disc, the improvement comprising a shaft, a sleeve axially displaceable on said shaft, a bearing encircling one end of said sleeve and rotatably supporting said elastic disc, a lever extending radially from the other end of said sleeve and rigidly attached thereto, and a pressure element for exerting a force in the axial direction connected to the end of said lever remote from said sleeve.

4,143,573
ELECTRICALLY CONDUCTIVE CUTTING BLOCK

Leonard K. Reichert, 16 Euston St., Brookline, Mass. 02146

Filed Dec. 19, 1977, Ser. No. 861,631
Int. Cl.[2] B26D 7/20
U.S. Cl. 83—658 21 Claims



9. A cutting block for providing an electrically conductive path comprising

a plurality of planar members, each member having a thickness between planes small compared to its length,

the planar members being assembled to form an integral laminated structure,

said laminated structure having substantially planar, parallel, broad opposing faces,

each pair of adjacent planar members being bonded to one another at their planar surfaces by an electrically conductive adhesive layer, the adhesive layer extending the entire distance between said opposing surfaces and forming a substantially continuous layer between the surfaces, and said conductive layer having an electrical conductivity substantially greater than the electrical conductivity of the planar members,

at least one electrically conductive rod extending through the interior of said laminated structure and passing through each of said adhesive layers,

each said electrically conductive rod being bonded to said members by an electrically conductive adhesive material, said adhesive material being in electrical contact with and forming a continuous electrical path between each of said electrically conductive layers,

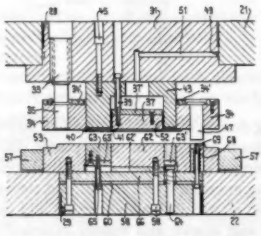
each said rod, at its ends, having means for mechanically securing the laminated structure together,

whereby a cutting edge contacting one of the opposing surfaces and in contact with at least one of said adhesive layers is in electrical contact with all of the adhesive layers and with the electrically conductive rods.

4,143,574
STAMPING DEVICE FOR A FINEBLANKING PRESS

Urs Ryser; Istvan Meszaros; Rudolf Graf, and Hans Reusser, all of Murten, Switzerland, assignors to Fribosa Ltd., Murten, Switzerland

Continuation of Ser. No. 709,791, Jul. 30, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 848,876
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1975, 2556466
Int. Cl.[2] B26D 1/00
U.S. Cl. 83—698 3 Claims



1. A device for a fineblanking press comprising a first unit and a plurality of interchangeable second units, each said second unit individually cooperable with said first unit;

said first unit comprising an upper shoe member, a lower shoe member, a plurality of outer guide posts interconnecting said shoe members, a lower punch support plate mounted on said lower shoe and including an interform punch to exert upward pressure on a workpiece;

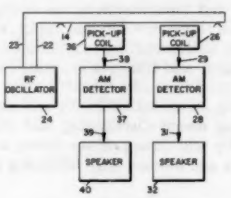
each said second unit comprising an upper support plate including spacedly located vertically mounted sleeve members extending therethrough radially inward of said outer guide posts, a punch mounted in fixed relation with said upper support plate to provide shear pressure on the workpiece, a plurality of vertically mounted inner tool guide posts spacedly located in said upper support plate respectively corresponding to said sleeve member locations, each said guide post having an upper part and a lower part, each said upper part extending through said upper support plate to be slidingly mounted within each said respective sleeve member, and a guide pressure plate surrounding said punch and exerting downward pressure on the workpiece against the upward pressure of said lower punch support plate and interform punch, each said guide post lower part mounted to extend through said pressure plate to provide guided movement therefor without deviation; and

said upper support plate operably connected to said upper shoe member and detachable therefrom to provide withdrawal separation of each said second unit from said first unit for interchanging with another said second unit.

4,143,575
ELECTRONIC SOUND GENERATING SYSTEM FOR A STRINGED MUSICAL INSTRUMENT

Richard C. Oliver, 8504 W. 125 N., West Lafayette, Ind. 47906

Filed Oct. 1, 1976, Ser. No. 728,865
Int. Cl.[2] G10H 1/00
U.S. Cl. 84—1.16 17 Claims



1. An electronic sound generating system for a musical instrument having at least one electrically conductive string, said system comprising:

RF signal producing means providing an output signal at an RF frequency;

means for connecting said RF signal producing means with an electrically conductive string of a musical instrument so that when so connected said output signal from said RF signal producing means is impressed upon said string;

first sensing means positionable adjacent to said string of said musical instrument so that when so positioned said sensing means senses vibratory motion of said string and produces an output signal dependent upon said sensed vibratory motion of said string;

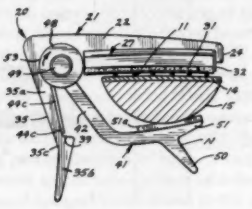
second sensing means positionable adjacent to said string of said musical instrument and normal to said first sensing means so that when so positioned said second sensing means senses vibratory motion of said string and produces an output indicative thereof; and

signal processing means connected with said first and second sensing means to receive the output therefrom and produce a stereo output for utilization purposes.

4,143,576
CAPO

Joseph C. Nichols, 2252 Goodrich Ave., St. Paul, Minn. 55105; John M. Berner, 3344 Harriet Ave., Minneapolis, Minn. 55408, and Mario F. Fernandez, 721 Kenwood Pkwy., Minneapolis, Minn. 55403

Filed Apr. 11, 1977, Ser. No. 786,113
Int. Cl.[2] G10D 3/04
U.S. Cl. 84—318 **9 Claims**

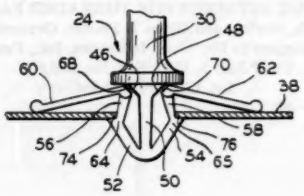


1. A capo mountable on the neck of a guitar to press the strings of the guitar against the guitar fretboard comprising a roller for engaging a string of a guitar, clamp means for mounting the roller, the clamp means including a horizontally elongated portion that has a horizontally elongated, downwardly opening notch and transversely opposite side portions extending above the notch, and a retainer member having a recess, a clamp member mounted on the clamp means for clampingly engaging the guitar neck, the retainer member being mounted on the horizontal portion to extend between the horizontal portion and the clamp member, the retainer member having transversely spaced, upwardly extending legs, the retainer member being extended into the notch to have its legs abut against the transversely opposite side portions of the horizontal portion and the recess open toward the clamp member, said roller being rotatably mounted in the recess to extend outwardly of the recess toward the clamp member.

4,143,577
ANCHOR BASE FASTENER

Robert M. Eberhardt, Park Ridge, Ill., assignor to All States Plastic Manufacturing Co., Inc., Chicago, Ill.

Filed Mar. 28, 1977, Ser. No. 781,633
Int. Cl.[2] F16B 19/00
U.S. Cl. 85—5 R **15 Claims**

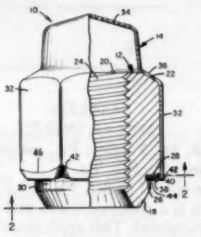


1. An anchor base for a one-piece plastic device comprising a base having two separate series of interconnected and mutually articulated lever arms formed thereon, each of said two separate series of said lever arms comprising actuator, operating, and lateral supporting arms, joined at one end to a central spar extending from at least a pair of bearing cam surfaces inclined from said base toward said central spar, each of said series of arms including said actuator arm integral at said one end with and depending angularly from the end of said spar to form a generally arrowhead configuration, said operating arm dependent from the other end of said actuator arm and joined thereto at an obtuse angle to form in conjunction with the operating and actuator arms of the other series a generally diamond-shaped configuration, and said lateral support lever arm being joined to an opposite end of said operating arm, said lateral support lever arm extending away from the operating arm to form an acute angle therewith, the end of said lateral support arm nearest said central spar having a bearing surface which is completely separate from but works against a bearing formed by said bearing cam surfaces in order to articulate said series of lever arms.

4,143,578
CAPPED MACHINE NUT AND METHOD OF MANUFACTURE

Phillip D. Becker, Southbury, Conn., assignor to Buell Industries, Inc., Waterbury, Conn.

Filed May 27, 1977, Ser. No. 801,154
Int. Cl.[2] F16B 37/14
U.S. Cl. 85—35 **4 Claims**



1. A capped machine nut comprising a metal body with polygonal side walls and a threaded bolt hole extending axially through said body, said nut body having a conical bearing face at a first axial end and a first shoulder at its opposite axial end, a peripheral groove in said nut body located axially intermediate said conical bearing face and said polygonal side walls, said groove forming a substantially right-angled second shoulder immediately adjacent and axially terminating said polygonal side walls; and a cup-shaped sheet metal cap having polygonal side walls closely conforming to the side walls of said nut body and preventing relative rotational movement between them, said cap at its closed end having a domed portion extending axially beyond said first shoulder of said nut body, said domed portion joining said polygonal side walls of said cap to form an annular seat which rests on said first shoulder of said nut body to maintain said domed portion in axially spaced relation to said first shoulder of said nut body, said cup having the lip at its open end extending from said side walls of said nut body over said right-angled second shoulder, first, sharply axially inwardly of said groove at each apex of two of said nut body side walls in a triangular shape to form dihedrals converging inwardly of said groove and, second, sharply inwardly of said groove intermediate each pair of said apices to secure said nut body and cap together against relative axial and relative rotational movement and whereby the configuration of the lip of said cap as aforesaid resists the tendency to loosen from extend-over said right-angled second shoulder inwardly of said groove.

2. The method of making a capped machine nut having a polygonal-sided metal nut body having a first shoulder at one axial end, a conical bearing surface at the opposite end and a threaded bolt hole extending axially through said body, and a cup-shaped sheet metal cap having polygonal side walls adapted to closely conform to the side walls of the nut body and prevent relative rotation between them, said cap further having at its closed end a domed portion integrally formed with said side walls to provide an annular seat adapted to abut the first shoulder of said nut, wherein said method comprises the steps of

forming a peripheral groove in said nut body axially intermediate said conical bearing surface and said polygonal side walls to provide a substantially right-angled second shoul-

der immediately adjacent and axially terminating said polygonal side walls,

inserting said nut body into said cap to cause said first shoulder to abut said annular seat in said cap, and

crimping the lip at the open end of said cup into said peripheral groove sharply axially inwardly over said right-angled second shoulder at each apex of two of said nut body side walls to produce triangular dihedrals converging inwardly of said groove and sharply inwardly over said right-angled second shoulder intermediate each pair of said apices, said dihedrals thereby being locked in such condition by the crimped portion of said lip intermediate said apices.

4,143,579

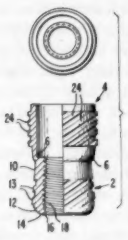
METAL INSERT

Theodore Ziaylek, Jr., Yardley, Pa., assignor to Yardley Products Corporation, Yardley, Pa.

Continuation-in-part of Ser. No. 729,579, Oct. 4, 1976, abandoned, which is a continuation-in-part of Ser. No. 595,472, Jul. 14, 1975, abandoned. This application Nov. 11, 1977, Ser. No. 850,575

Int. Cl.[2] F16B *13/06*

U.S. Cl. 85—72 **3 Claims**



1. A one piece metal insert adapted to be embedded in a cylindrical cavity of predetermined diameter in a work piece, said insert comprising a substantially cylindrical nut portion and a substantially cylindrical sleeve portion joined by a frangible connection, said sleeve portion having an external diameter approximately equal to said predetermined diameter of the cavity in the work piece and having an internal diameter which is less than that of a zone of maximum diameter of said nut portion of the insert, said nut portion having axially inclined ribs being inclined in one direction on the exterior thereof in said zone of maximum diameter adapted to cut into the sleeve portion and establish a positive connection with the sleeve portion when the nut portion is forced against the bottom of the cavity and the sleeve portion is forced into the cavity and about said nut portion, said sleeve portion having axially inclined splines on the exterior thereof adapted to cause the sleeve portion to be threaded into the material on the side walls of said cavity as it is forced into the cavity, said axially inclined splines being axially inclined in the same direction as said axially inclined ribs and at approximately the same angle, said ribs and splines cooperating by being inclined in the same direction to cause said sleeve portion to be rotated and subjected to metal working action when it is forced into the cavity and expanded radially by said nut portion of the insert in order to prevent fracture of said sleeve portion during expansion thereof.

4,143,580

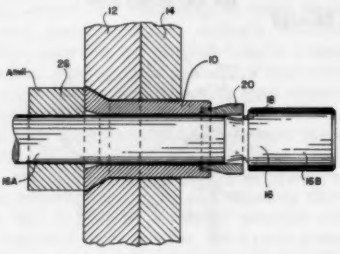
LOCK SPINDLE BLIND RIVET

Ralph R. Luhm, Brea, Calif., assignor to Allfast, Inc., City of Industry, Calif.

Filed Dec. 20, 1976, Ser. No. 752,573

Int. Cl.[2] F16B *13/06*

U.S. Cl. 85—77 **4 Claims**



1. A locking rivet comprising:

a stem having a forward section and a rear section separated by an annular locking groove,

a sleeve mounted on said forward section, having a head and an annular recess located at the forwardmost end thereof,

said rear section including an enlarged head having a diameter greater than that of the remainder of said stem, an axial length as long as a major portion of the length of said sleeve, and defining substantially radial shoulder means adjacent said locking groove,

a malleable locking collar mounted on said stem between said sleeve and said shoulder means and having an outer diameter larger than the inner diameter of said sleeve,

said collar including means for flaring outwardly the rear end of said sleeve,

said stem including means for:

(a) swaging said collar inwardly into said locking groove,

(b) moving said collar through said sleeve,

(c) swaging said collar outwardly into said annular recess

thereby locking together said stem and sleeve,

the inner bore of said sleeve being substantially free of obstruction to the moving of said collar through said sleeve.

4,143,581

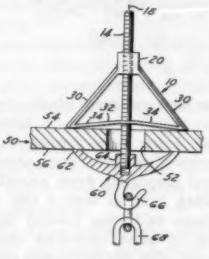
ANCHORING RETAINER FOR THREADED FASTENERS

Jon D. Smith, Fenton, and Glenn T. Parker, Ortonville, both of Mich., assignors to Dry Dock Industries, Inc., Fenton, Mich.

Filed Jun. 6, 1977, Ser. No. 803,806

Int. Cl.[2] F16B *35/04*

U.S. Cl. 85—80 **11 Claims**



1. A retainer for mounting at one side of a supporting structure having an opening therein, said retainer being adapted to be used with a threaded element which extends from the other side of the supporting structure through the opening into the retainer, said retainer comprising a flexible unitary one-piece

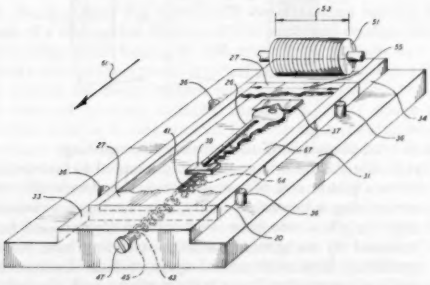
body made from a plastic material, said body being symmetrical about a centrally located axis which is adapted to extend through the opening in the supporting structure, said body having a top, a bottom and a pair of sides, said body between said sides being of substantially uniform width between said top and said bottom, said body being of generally triangular configuration when viewed from either one of the sides thereof, said body having a sleeve provided with a sleeve opening surrounding said axis at the apex of the triangular configuration, which corresponds to the top of said body, said sleeve having a first pair of parallel edge surfaces forming part of the parallel sides of said body, and a second pair of parallel edge surfaces perpencidular to said first pair of parallel edge surfaces and located on opposite sides of said axis, said second pair of edge surfaces being provided with a pair of integrally formed outwardly diverging flexible legs, said legs having side surfaces forming part of the parallel sides of said body, and a flexible control strut spaced axially from said sleeve and having the ends thereof integrally connected to the outer ends of said outwardly diverging flexible legs for limiting the spread of said legs, said control strut having side surfaces forming part of the parallel sides of said body, said control strut having a central aperture axially aligned with and spaced from said sleeve opening and through which the threaded element is adapted to extend, said control strut being adapted to move away from said sleeve and towards the supporting structure to flex said outwardly diverging flexible legs upon the threading of the threaded element into the opening in said sleeve.

4,143,582

METHOD AND APPARATUS FOR MAKING A SECONDARY KEY FOR A LOCK MECHANISM

Joseph B. Heimann, 502 Marlbrook La., Lansdale, Pa. 19446

Filed Apr. 25, 1977, Ser. No. 790,824
Int. Cl.² B23C *3/24*
U.S. Cl. 90—13.05 **10 Claims**



1. A method of producing a secondary key from a primary key comprising the steps of:

(a) making a dimensionally stable three dimensional recording of at least one side of the primary key in a pliable material, said recording showing contours and locations of warding grooves and bits and key blank shape;

(b) comparing the recordings so made with available key blanks to determine the proper key blank to be used;

(c) determining the contour of each bit on the key;

(d) determining the X and Y position with respect to fixed surfaces on the key of the center of the bottom of each bit; and

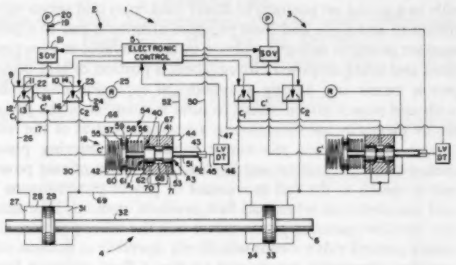
(e) using said bit contour information and X and Y information for cutting a secondary key with the required bits, from the proper key blank.

4,143,583

REDUNDANT EHV FAULT DETECTOR

Dan O. Bauer, Portage, and Richard P. Heintz, Kalamazoo, both of Mich., assignors to Pneumo Corporation, Boston, Mass.

Filed Sep. 23, 1977, Ser. No. 835,993
Int. Cl.² F15B *13/06*
U.S. Cl. 91—1 **27 Claims**



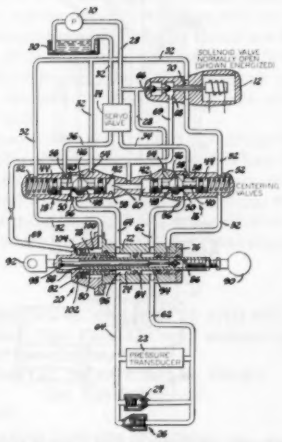
1. A monitor for monitoring the condition of a fluid system, comprising: a housing, sensor spool means movable in said housing and forming therewith plural respectively substantially fluidically isolated chambers for converting respective fluid pressures applied to said chambers from such system to representative forces, said spool means including plural surface areas exposed to fluid pressure in respective chambers in respective directions such that at least one of such forces opposes at least two of such forces tending to move said spool means to respective positions in said housing as an indication of the condition of such fluid system.

4,143,584

ELECTROHYDRAULIC SERVO ACTUATOR WITH CENTERING CONTROL

Dale M. Reneau, Santa Barbara, Calif., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 31, 1977, Ser. No. 824,466
Int. Cl.² F01B *1/00, 7/00*
U.S. Cl. 91—172 **1 Claim**



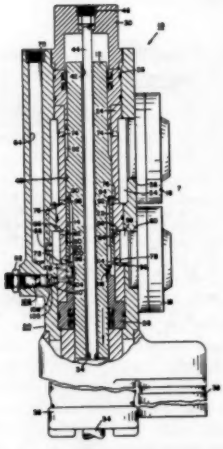
1. A hydraulic actuator for use with a source of fluid pressure, said actuator comprising; power output means having first and second fluid pressure chambers and power piston means separating said pressure chambers and being movable in one direction in response to fluid pressure in the first chamber

and movable in another direction in response to fluid pressure in the other chamber; a source of fluid pressure; servo valve means between the pressure source and said power output means for selectively directing fluid pressure from the pressure source to said fluid pressure chambers; two centering valve means including spring means and pressure responsive means and a respective one of said centering valve means being disposed in fluid communication between said servo valve means and a pressure chamber of said power output and being movable to a spring set position to direct fluid from said servo valve means to and from said fluid pressure chambers and to a pressure set position; centering piston means movable to two positions and being disposed circumjacent a portion of said power piston means and having a cylindrical extension engageable with said power piston means to limit movement of the power piston means in one direction to a position central of the total power piston means movement when the centering piston means is in one position and limiting movement of said power piston means to the full movement of power piston means in said one direction when said first pressure chamber is pressurized and the centering piston means is in the other position; and center control valve means selectively operable to exhaust said pressure responsive means and to direct fluid pressure from said source to said pressure responsive means of said centering valve means whereby said centering valve means are moved to the pressure set position to disconnect said servo valve means from said fluid pressure chambers, to connect said second pressure chamber to exhaust, to connect said first pressure chamber to said source, and to connect said centering piston means to said pressure source whereby said centering piston means is moved to said one position, and said power piston means is restrained from movement in said one direction by said centering piston and restrained from movement in the other direction by fluid pressure in said first chamber.

4,143,585
IMPACT TOOL

Roger L. Selsam, Fairport, N.Y., assignor to Hydroacoustics, Inc., Rochester, N.Y.

Continuation-in-part of Ser. No. 682,820, May 3, 1976, abandoned. This application Aug. 5, 1977, Ser. No. 822,113
Int. Cl.[2] F01B *7/18;* F01L *17/00, 25/06*
U.S. Cl. 91—276 **21 Claims**



1. In a hydraulic oscillator having a piston and valve element both movable in opposite directions and both disposed in a cavity in which hydraulic pressure is switched in opposite senses between supply and return pressures by said valve element to develop forces to effect the oscillatory movements of said piston in said opposite directions, apparatus for controlling the frequency and displacement of said piston by controlling the movement of said valve element which comprises

(a) means in said cavity defining a pocket for receiving said valve element when it moves in one of said directions and has switched the fluid pressure in said cavity in one of said opposite senses so as to develop forces on said piston in the direction opposite to said one direction,

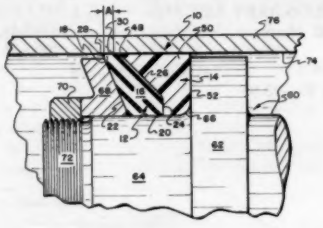
(b) channel means operative when in communication with said pocket for providing a path for the controllable flow of hydraulic fluid from said pocket when said valve element is received therein, and

(c) means in said piston for providing said communication between said channel means and said pocket when said piston has moved to a position near the end of its displacement in said one direction, for closing off communication with said pocket when said piston has moved in said opposite direction away from said position near said end of said displacement in said one direction so as to trap said valve element and said fluid in said pocket, whereby the displacement of said valve in said one direction and the period of time for said valve element to switch the fluid pressure in said cavity in the other of said opposite senses so as to again enable the development of forces on said piston in said one direction is controllable as a function of the flow through said channel means.

4,143,586
MUD PUMP PISTON

Gordon T. Zitting, Sandy, Utah, assignor to Poly-Seal, Salt Lake City, Utah

Continuation of Ser. No. 626,671, Oct. 28, 1975, abandoned. This application May 16, 1977, Ser. No. 810,350
Int. Cl.[2] F16J *1/06, 9/00*
U.S. Cl. 92—206 **3 Claims**



1. A mud pump piston seal assembly comprising:

a yieldable elastomeric annular ring adapted to be mounted upon a piston rod of a mud pump, the elastomeric ring comprising a central aperture face having a substantial axial length, a non-bifurcated solid wedge-shaped body bounded by an annular radially extending base surface extending from said central aperture face, forward and trailing converging linear body surfaces each disposed at an acute angle to the radial direction, said forward body surface extending from said annular base surface and said trailing body surface extending from said central aperture face, which converging linear body surfaces respectively merge with more sharply outwardly divergent tapered linear tip surfaces which intersect with each other in an unstressed state at an angle less than 90 degrees to form a circumferential annular diagonally directed apex, the unstressed apex having a diameter greater than any other portion of the elastomeric annular ring, one of said tip surfaces being essentially radially directed, the length of either linear tip surface being substantially less than the axial length of the central aperture face of the elastomeric annular ring;

an anti-extrusion ring of rigid synthetic resinous material having cold flow creep wear take-up characteristics adapted to contiguously frictionally engage the wall of a

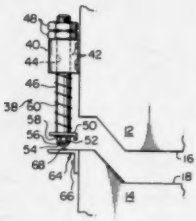
cylinder notwithstanding wear, the anit-extrusion ring further comprising an axial central aperture face having a predetermined axial length and adapted to be mounted upon a piston rod, a circumferential annular face having a maximum diameter less than the diameter of the tip of the elastomeric ring, the circumferential annular face having an axial length substantially greater than the predetermined axial length of the central aperture face of the anti-extrusion ring and substantially greater than the length of either of the two linear tip surfaces of the elastomeric annular ring, the anti-extrusion ring also comprising an annular surface matching contiguously with one of the two converging body surfaces and the base surface of the elastomeric ring whereby the elastomeric ring is contiguously cradled, exclusive of the tip, by the rigid anti-extrusion ring and the elastomeric annular ring and the anti-extrusion ring are unitarily displaced with a piston rod when mounted thereon in axially aligned relation.

4,143,587

APPARATUS FOR DEFORMING CORRUGATED FIBERBOARD

Toshihiko Fujii, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 20, 1977, Ser. No. 817,434
Claims priority, application Japan, Jul. 22, 1976, 51-97806[U]
Int. Cl.[2] B30B *15/34*; B31B *43/00*
U.S. Cl. 93—1 D **11 Claims**



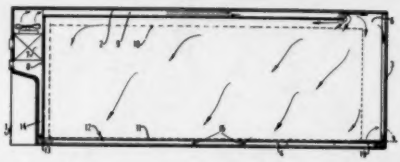
1. An apparatus for inelastically deforming an initially flat blank of a corrugated fiberboard into a curved configuration, said configuration having at least one curved portion with an axis of curvature in a predetermined direction, comprising first and second die blocks which have complementarily convex and concave pressing surfaces, respectively, and which are movable relative to one another for forming a predetermined clearance between said pressing surfaces when the die blocks are moved into predetermined relative positions, heating means for heating said die blocks when actuated, and blank retaining means comprising (i) a rigid, substantially straight elongated pressing member extending substantially in parallel with said predetermined direction throughout the length of the pressing member and supported on and movable with one of the first and second die blocks, the pressing member having a substantially semicylindrical portion with a crown extending throughout the length of the pressing member and protruding in a direction substantially parallel with the direction in which said first and second die blocks are movable toward said relative positions, the pressing member being movable relative to the die block supporting the pressing member in said direction substantially parallel with the direction in which the die blocks are movable relative to one another, and (ii) an elongated bracket extending substantially in parallel with said pressing member, stationary relative to the other of said die blocks and having a surface portion opposed to and spaced apart from said crown in the direction in which the die blocks are movable relative to one another, said pressing member and said bracket being operative to have a marginal portion of a blank of a corrugated fiberboard clamped and locally collapsed between said crown of the pressing member and said surface portion of the bracket while allowing the marginal portion to move in a direction perpendicular to said predetermined direction when said die blocks are in said relative positions with the blank of the corrugated fiberboard clamped between the respective pressing surfaces of the die blocks and forcing said marginal portion to move inboardly of said clearance.

4,143,588

CONTAINER COMPRISING AN IMPROVED FLOOR STRUCTURE

Petrus A. T. Exler, Stadhoudersing 70, Zoetermeer, Netherlands

Filed Aug. 2, 1977, Ser. No. 821,191
Claims priority, application Netherlands, Aug. 3, 1976, 7608639
Int. Cl.[2] B65J *1/02*; F24F *13/00*
U.S. Cl. 98—6 **5 Claims**



1. A container for transporting goods under a controlled environment, comprising in combination:

an enclosed, generally box-like container providing a bottom wall, a top wall, opposite end walls and opposite side walls;

partition means adjacent one end wall and defining a vertical space therewith;

ventillation means for causing air to be inducted into the bottom of said vertical space and discharged at the top of said vertical space;

a feeding channel communicating with said top of the vertical space and extending generally centrally along said top wall toward that other end wall remote from said partition means and terminating in a discharge opening adjacent the juncture between said top wall and said other end wall, whereby all of the air circulated by said ventillation means is discharged into the container space adjacent said juncture;

floor means defining return flow passages communicating with said bottom of said vertical space for providing uniform temperature and humidity conditions throughout the cargo space of the container, said return flow passages having inlet openings remote from said one end wall to provide a majority of return air flow area adjacent said other end and

said floor means comprises a plurality of groups of channels in which channels of each group are of different lengths to present inlet openings progressively more remote from said one end wall, and upstanding partitions forming extensions of those channels terminating short of said other end wall, which extensions extend to said other end wall.

4,143,589

COFFEE BREWING APPARATUS AND METHOD

Robert L. Weber, New Canaan, Conn., assignor to Webston Incorporated, New Canaan, Conn.

Filed Oct. 19, 1977, Ser. No. 843,421
Int. Cl.[2] A47J *31/32*
U.S. Cl. 99—282 **16 Claims**

1. Coffee brewing apparatus comprising:

a. a water heating chamber;

b. a water metering chamber;

c. valve means controlling communication between the heating chamber and the metering chamber;

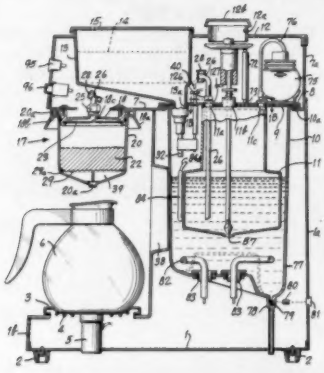
d. means, including said valve means, operable to fill the

metering chamber to a predetermined level with heated water;

e. a coffee brewing chamber;

f. a conduit having an open entrance end in the metering chamber and extending above the upper end thereof to a discharge end in the brewing chamber;

g. means for adjusting the vertical position of said open entrance end; and



h. means operable to close the valve means and thereafter to supply air under pressure to the metering chamber above the surface of the water therein to discharge water through the conduit into the brewing chamber and to terminate that discharge after the level drops below said open end, so as to discharge into the brewing chamber a quantity of heated water determined by the adjusted position of the open entrance end of the conduit.

4,143,590

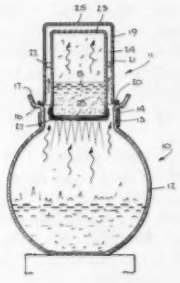
COFFEE MAKER ASSEMBLY

Sam Kasakoff, 329 E. 58th St., New York, N.Y. 10022

Filed Feb. 21, 1978, Ser. No. 879,594

Int. Cl.[2] A47J *31/02*

U.S. Cl. 99—296 **9 Claims**



1. A coffee maker assembly for rapidly producing a coffee brew of good quality, said assembly comprising:

A. a decanter for boiling water, said decanter being formed by a bowl having a cylindrical neck provided with an outwardly-extending flange; and

B. a container constituted by a cylindrical outer cup whose diameter substantially matches the diameter of the decanter neck and a cylindrical inner cup of smaller diameter coaxially supported within the outer cup, the region between the cups defining a steam jacket, said inner cup being provided with a removable cap which is permeable to liquid and gas but not to ground coffee, whereby when a charge of ground coffee is placed in the inner cup and some of the water boiled in said decanter is poured thereover, this produces a coffee brew in the inner cup, and when the inner cup is thereafter capped and the container inverted over the decanter with the rim of the outer cup resting on the flange, steam evolved in said decanter fills the steam jacket to heat the interior of the inner cup and also penetrates the inner cup through said cap to produce a head of steam over the coffee brew therein to express the brew into the decanter.

4,143,591

DEVICE FOR THE PRODUCTION OF GRANULATED PRODUCTS FROM SOLUTIONS OR SUSPENSIONS OF FOOD SUBSTANCES

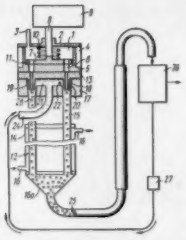
Jury F. Yaroshenko; Rodriges S. Gonsales; Sergei V. Rogozhin, and Vladimir I. Misjurev, all of Moscow, U.S.S.R., assignors to Vsesojuzny nauchno-issledovatelsky i experimentalno-konstruktorsky institut prodovolstvennogo mashinostroenia VNIEKIPRODMASH, U.S.S.R.

Filed Jun. 20, 1977, Ser. No. 808,389

Claims priority, application U.S.S.R., Jun. 28, 1976, 2378188[I]

Int. Cl.[2] A23C *9/02*

U.S. Cl. 99—483 **7 Claims**



1. A device for the production of granulated products from solutions or suspensions of food substances comprising: a heated chamber for keeping said solutions or suspensions under pressure having a bottom; through holes in the bottom of said heated chamber arranged along a concentrical circumference; a rotatable disk located inside said heated chamber and tightly pressed against said bottom of said chamber from inside; through holes in said rotatable disk along a concentrical circumference matching in succession with said holes in said bottom of said heated chamber during rotation of the disk; a means for rotation of said disk; a heat-insulating spacer arranged under said heated chamber; nozzles made in said heat-insulating spacer in the number equal to the number of said holes in said bottom and arranged coaxially with said holes; a vessel containing liquid for formation of granules from the solutions or the suspensions of food substances fed into said vessel via the holes in the bottom and provided with a cooling means; said vessel being actually a tubular heat exchanger installed under said chamber and attached to its bottom through said heat-insulating spacer; tubes of said tubular heat exchanger, whose upper ends are positioned in axial alignment with the holes in the bottom and communicating with said holes via the nozzles of said heat-insulating spacer, said tubes being equal in number to the number to the holes in the chamber bottom and being located so that the upper end of each tube accommodates one nozzle of said heat-insulating spacer with an annular gap to intercommunicate said tubes; a pipe for feeding forming liquid to said vessel, which communicates with said tubes through the annular gaps formed between said nozzles and the upper ends of said tubes; a flange adjoining said heat-insulating spacer receiving the top ends of said heat exchanger tubes; a cavity formed between said flange and said heat-insulating spacer providing fluid communication amongst said tubes and with the pipe supplying the forming liquid; and

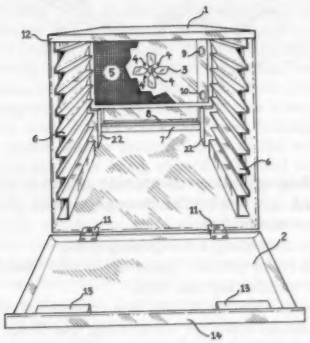
a pipe for taking granules with said forming liquid from said vessel.

4,143,592

APPARATUS FOR FOOD DEHYDRATION AND RAISING BAKERY PRODUCTS DOUGHS

Johnnie Kuest, and Elsie Kuest, both of P.O. Box 110, Filer, Id. 83328

Filed Aug. 11, 1977, Ser. No. 823,875
Int. Cl.[2] A23C 3/02
U.S. Cl. 99—483 **3 Claims**



1. An apparatus for food dehydration and bakery product dough raising comprising:

(a) a cabinet defining a dehydration and dough raising chamber;

(b) a frontal access door defining the front side of said chamber;

(c) means for attaching said frontal access door to said cabinet at a distance so as to define exhaust vents between said cabinet and said frontal access door;

(d) the side of said cabinet opposite the frontal access door having a plurality of intake ports;

(e) a plurality of support shelves attached to the interior side walls of said cabinet in paired relationship for supporting drying racks and a dough raising shelf in a horizontal plane;

(f) a plurality of drying racks resting upon said support shelves so as to be in vertical spaced relationship to each other so as to define air passageways between said drying racks;

(g) a dough raising shelf for supporting bakery product dough adaptable for resting upon said support shelves;

(h) means for increasing the relative humidity within said chamber when used for raising dough;

(i) a constant speed blower motor and fan mounted upon the rear wall of said cabinet for continuously drawing replacement air from the intake ports, through the chamber and between the drying racks to exit through the exhaust vents when the chamber is used for dehydrating foodstuffs;

(j) a screen disposed in said cabinet between said fan and drying racks so as to diffuse replacement air uniformly throughout the air passageways defined by the plurality of drying racks;

(k) means for stopping said distribution of replacement air when raising bakery product doughs;

(l) heating means disposed within said chamber for elevating the temperature therein; and

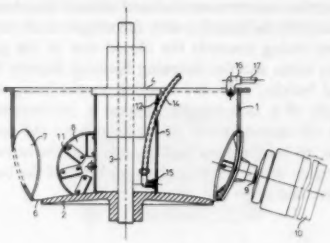
(m) means for regulating the temperature of the air within said chamber adaptable to regulate said temperature within the foodstuff dehydration temperature range of 100° F. to 160° F. and the dough raising temperature range of 75° F. to 100° F.

4,143,593

PEELING MACHINE

Albertus van Raay, Ulft, Netherlands, assignor to Machinefabriek "Finis" B.V., Ulft, Netherlands

Filed Apr. 25, 1977, Ser. No. 790,250
Claims priority, application Netherlands, Apr. 23, 1976, 7604310
Int. Cl.[2] A23N 7/02, 15/08; A47J 17/18
U.S. Cl. 99—631 **2 Claims**



1. A machine for peeling vegetable tubers such as potatoes and onions, comprising

a vessel having side walls including peeling means for removing peelings from vegetables tumbled about in said vessel,

said peeling means including at least one rotary peeling cutter mounted in said side walls,

a rotatable bottom in said vessel operable to tumble the vegetables against said peeling means,

at least one nozzle supported near the center and bottom of said vessel and directed outward toward said side walls,

means supplying air under pressure to said nozzle to direct a flow of air outward through the vegetables being peeled,

at least one spray nozzle supported near the top and adjacent said side wall of said vessel, and

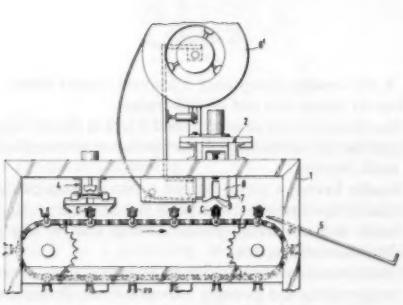
means supplying water to said spray nozzle.

4,143,594

DEVICE FOR BINDING BUNDLES OF ELONGATE ANGLE-SECTION MEMBERS AND MANUFACTURING APPARATUS INCORPORATING SUCH DEVICES

René G. Falcq, Chaudfontaine (Embourg), Belgium, assignor to Societe Anonyme Metal Deploye Belge, Sclessin-Ougree, Belgium

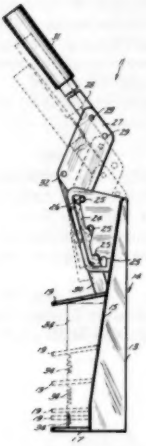
Filed Nov. 23, 1977, Ser. No. 854,353
Claims priority, application Belgium, Nov. 29, 1976, 645780
Int. Cl.[2] B65B 13/18
U.S. Cl. 100—7 **11 Claims**



1. A device for binding bundles of similar angle-section members so arranged that in each such bundle the ridges of the angle-section members all face in the same direction and each

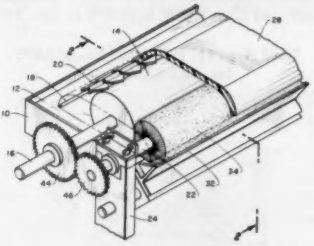
angle-section member is nested snugly within the next so that the ridge of one angle-section member is presented outwardly at one lateral boundary of the bundle and the valley of another angle-section member is presented outwardly at the opposite lateral boundary of the bundle, the device comprising an element having a bifurcated end, the element having two arms which form said bifurcated end, means for supporting a bendable fastening filament in a position extending between said two arms, and bending means for bending fastening filament ends, whereby said element can be thrust over a said bundle of angle-section members so that said arms of the element pass on either side of the bundle, with the ridges of the angle-section members facing towards the closed end of the gap between said two arms, and the fastening filament thereby bent around the said bundle, said end bending means being operable by approach of a said bundle beyond a predetermined extent toward the closed end of said gap to bend the ends of a said filament, so bent around said bundle, into the outwardly presented valley of the angle-section member of the bundle which is nearest said open end of said gap.

4,143,595
CAN CRUSHER
Larry N. Carlson, 6096 Pheasant St., Haslett, Mich. 48840
Filed Dec. 21, 1977, Ser. No. 862,754
Int. Cl.[2] B30B *1/04*
U.S. Cl. 100—280 **5 Claims**



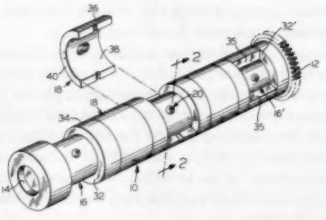
1. A can crusher comprising a channel shaped frame;
a barrier across one end of said frame;
a stanchion element secured to said frame at the end opposite said barrier and having plural fulcrum notches and a guide track therein;
a handle having a pivot pin and a piston connector pin in spaced-apart relation, said pivot pin movable in said guide track and selectively positionable in one of said plural fulcrum notches; and
a piston connected to said handle by said connector pin and reciprocably and guidably movable in said frame in increments established by said fulcrum notches toward and away from said barrier initially at an angle to the plane of said barrier and thereafter approaching plane registry with said barrier.

4,143,596
LITHOGRAPHIC PRESS DAMPENING SYSTEM
Robert W. Ivett, 17425 Stare St., Northridge, Calif. 91325
Filed May 4, 1977, Ser. No. 793,830
Int. Cl.[2] B41F *7/30*
U.S. Cl. 101—148 **7 Claims**



1. In a lithographic press dampening system in which a fluid is transferred to a plate roller through a series of rollers, the improvement comprising:
a fountain containing a dampening fluid;
a fountain roller partially immersed in said fluid for picking up and transferring said fluid;
a brush roller having bristles in a continuous contact with said fountain roller for transferring said fluid;
an elongate flicker bar adjacent to said brush roller engaging and bending said bristles for deflecting the fluid from said brush roller to said series of rollers;
first means for rotatably driving said fountain roller; and
second means for driving said brush roller counter to and at an overspeed with respect to said fountain roller whereby the bristles of said brush have a slight wiping action against the fountain roller picking up a uniform volume of dampening fluid;
whereby said fluid is transferred to said plate cylinder from said series of rollers.

4,143,597
RESILIENT PLATE CLAMPING MEANS
Martin Kesten, West Hartford, and Frank W. Tevald, Enfield, both of Conn., assignors to Preston Engravers, Inc., Windsor, Conn.
Filed Apr. 27, 1977, Ser. No. 791,474
Int. Cl.[2] B41F *27/06, 27/10*
U.S. Cl. 101—378 **18 Claims**



1. A press cylinder assembly comprising:
(a) a support cylinder having at least one circumferentially extending mounting recess formed therein to define a recessed mounting surface and circumferentially extending sidewalls;
(b) at least one arcuate saddle member having an inside surface and arcuate sidewalls and being removably mounted on said support cylinder within said one mount-

ing recess with its sidewalls adjacent said circumferential sidewalls of the mounting recess;

(c) at least one mounting stud and at least one locking recess, one of which is situated on said mounting surface of said support cylinder, and the other of which is situated on said inside surface of said one saddle member, said one mounting stud being affixed at one end to the member providing the surface on which it is situated and having a mounting head on its other end and a neck portion of lesser width than the width of said mounting head, said neck portion being formed between said mounting head and said one end, and said one locking recess extending into the member providing the surface on which it is situated; and

(d) a plurality of resiliently deflectable locking members mounted on said member providing the surface on which said one locking recess is situated and extending in spaced relationship within said one locking recess, said one stud projecting into said one locking recess with said mounting head disposed in said one locking recess inwardly of and between said locking members, said locking members being spaced apart a distance less than the width of said mounting head and being aligned with said neck portion on opposite sides thereof to resiliently lock said one mounting stud therebetween and thereby maintain said one saddle member on said support cylinder.

15. A press cylinder assembly comprising:

(a) a support cylinder having an outer surface and at least one circumferentially extending mounting recess formed therein, said recess having circumferentially extending side walls and a convex floor surface, and a locking recess formed in said floor surface of said mounting recess;

(b) at least one arcuate saddle member received within said mounting recess, said one saddle member having a concaved inside surface which is substantially congruent to and seated upon said convex floor surface, and further having arcuate side walls abutting said circumferentially extending side walls and an outside surface on which marking means is supported;

(c) at least one mounting stud including a shaft affixed at one end to said one saddle member, a mounting head at its other end and a neck portion formed between said mounting head and said shaft, said nec portion being of lesser width than said mounting head, said mounting head and said neck portion projecting outwardly of said inside surface of said one saddle member;

(d) a plurality of resiliently deflectable locking members mounted on said support cylinder and extending in spaced relationship within said locking recess, said locking members being spaced apart a distance less than the width of said mounting head, said one mounting stud projecting into said locking recess with said mounting head disposed between and aligned with said locking members whereby said locking members resiliently lock said one mounting stud therebetween to thereby maintain said one saddle member on said support cylinder.

4,143,598

NON-MAGNETIC ANTI-PERSONNEL WAR MINE

Joseph G. Marer, Berne, Switzerland, assignor to Redon Trust, Lichtenstein, Liechtenstein

Filed Apr. 7, 1977, Ser. No. 785,479

Claims priority, application Switzerland, Apr. 23, 1976, 005024/76; Jan. 28, 1977, 001155/77

Int. Cl.[2] F42B *23/28*

U.S. Cl. 102—8 **9 Claims**

1. In a non-magnetic anti-personnel war mine, capable of being sown manually and mechanically, having:

(i) a plastic body having an upper part and a lower part, and including a central hole and a lateral hole, the upper part being closed by a cap of elastic material to constitute a variable volume and pressure air chamber, the lower part being closed by a pan and constituting a cylindrical housing,

(ii) a firing pin plunger safety and release device, a detonator, and an explosive charge, all contained in said cylindrical housing,

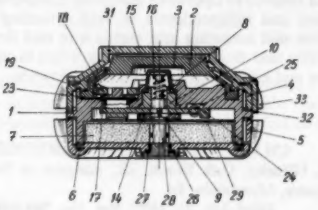
(iii) a firing pin plunger in said central hole of the plastic body,

(iv) a bag-shaped membrane in said lateral hole of the plastic body,

the improvement that:

(a) said firing pin plunger is guided within a guide socket,

(b) said bag-shaped membrane is retained in said plastic body by a retaining ring which rests upon a first disc having an eccentrically drilled hole and a maze on its lower surface, said maze communicating with a centrally drilled hole in



a second disc which ensures the sealing between the first disc and the bag-shaped membrane,

(c) said firing pin plunger safety and release device is formed by a lever with two arms, in balance with respect to its centre of rotation, one said arm resting against said bag-shaped membrane, the other said arm being subjected to the force of a spring, the whole being arranged so that, when a predetermined pressure is applied to said cap, said pressure causes the compression of a spring acting upon said firing pin plunger and an increase in the air pressure within the air chamber such that the bag-shaped membrane inflates and causes rotation of the firing pin plunger safety and release device to allow the mine to explode.

4,143,599

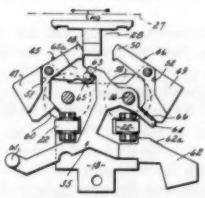
POWER AND FREE TROLLEY APPARATUS

Robert Kramer, deceased, late of White Bear Lake, Minn. (by Ruth Kramer, administratrix), assignor to A-T-O Inc., Willoughby, Ohio

Filed Sep. 27, 1977, Ser. No. 837,275

Int. Cl.[2] B61B *10/02*

U.S. Cl. 104—172 S **25 Claims**



1. In a power and free conveyor, improved accumulating trolley apparatus comprising:

a trolley body,

a pusher dog pivoted to said trolley body and having an operative drive position, wherein said pusher dog is engageable by a propelling member, and an accumulate position wherein said pusher dog is not engageable by a propelling member,

a hold back dog pivoted to said trolley body and having an operative position wherein said hold back dog is engageable with said propelling member for holding said trolley body against forward movement with respect to same, and

an accumulate position, wherein said hold back dog is not engageable with a propelling member,

an actuating lever means in said trolley body movable from a first position to a second position for positively engaging and moving said pusher dog and said hold back dogs into said respective accumulate positions, and movable from said second position to said first position permitting said pusher dog and said hold back dog to return to their respective operative positions, said lever means extending forwardly of said trolley body for operative engagement with a preceding trolley,

said pusher dog and said hold back dog each being independently mounted with respect to each other and being normally biased by their own weight toward moving into said respective operative positions, independently of each other and independently of said actuating lever means when said actuating arm means is in said first position,

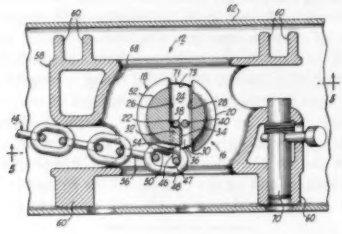
whereby said dogs are self-locking when in operative position and engaged by a propelling member.

4,143,600

CHAIN ATTACHMENT STRUCTURE

Emil J. Hlinsky, Oak Brook, Ill., assignor to MacLean-Fogg Company, Mundelein, Ill.

Filed Jan. 21, 1977, Ser. No. 760,869
Int. Cl.[2] B61D *45/00*
U.S. Cl. 105—477 **8 Claims**



1. A releasable chain attachment structure for a load-bearing chain winding device, said structure including:

a unitary, one-piece drum member having a periphery with a generally circular cross section;

a recess extending inwardly from the periphery of the drum member defined between a spaced-apart interfacing pair of internal walls;

a lug integral with said drum member extending part way from a first said internal wall toward the second internal wall;

the distance between said lug and the second internal wall being larger than the chain link thickness so that a chain link can be inserted along a path in said recess and into registration with said lug;

said lug being no larger than the interior of said link so that said link can be placed over said lug;

and a keeper movable into said recess to obstruct said chain insertion path for retaining said link on said lug;

the distance between the outermost end of said lug and the second internal wall being smaller than the side-to-side chain link width.

5. A releasable chain attachment structure for a load-bearing chain winding device, said structure including:

a unitary, one-piece drum member having a periphery with a generally circular cross section;

a recess extending diametrically inwardly from the periphery of the drum member defined between a spaced-apart interfacing pair of internal walls;

a lug integral with said drum member extending part way from a first said internal wall toward the second internal wall;

the distance between the outermost end of said lug and the second internal wall being larger than the chain link thickness so that a chain link can be inserted along a generally diametric path of said drum member in said recess and into registration with said lug;

said lug being no larger than the interior of said link so that said link can be placed over said lug;

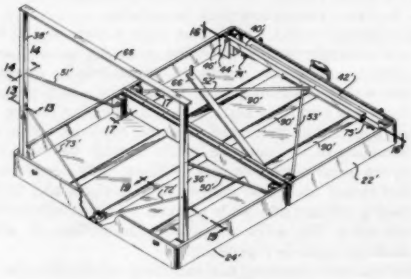
and a keeper movable into said recess to obstruct said chain insertion path for retaining said link on said lug.

4,143,601

FOLDABLE TABLES

Robert H. Pike, 403 Pitkin St., Ft. Collins, Colo. 80521

Filed Apr. 20, 1976, Ser. No. 678,687
Int. Cl.[2] A47B *3/087*
U.S. Cl. 108—35 **1 Claim**



1. In a foldable table having a pair of top sections hinged together along mating edge portions, each top section including a top panel and a peripheral skirt, a pair of legs pivotally mounted respectively adjacent to the outer corners of each top section and swingable between a downwardly-projecting support position and a folded position within the respective skirt, and means for pivotally mounting each of said legs to swing widthwise of said table between said support and folded positions;

individual ties angled respectively between different ones of said legs and said top sections and disposed widthwise for rigidifying said legs when in said support position, a plurality of struts each angled lengthwise of said table between a portion of a leg and a corresponding portion of a related top section, each said strut being respectively coupled fixedly in place at each end to swing with its associated leg between said support and folded positions;

the improvement comprising:

each of said ties being in the form of an elongated rigid rod;

means defined at one end of each of said rods for pivotally coupling said one end to the corresponding one of said legs;

means formed on the other end of each of said rods for defining a first part of a removable coupling;

means secured rigidly on the underside of said top sections adjacent to the outer margins thereof, opposite said mating edge portions, for defining a second part of said coupling fastenable to said first part in secure rigid mutual interrelationship;

a laterally-spaced plurality of reenforcing elements secured to the underside of respective ones of said top panels;

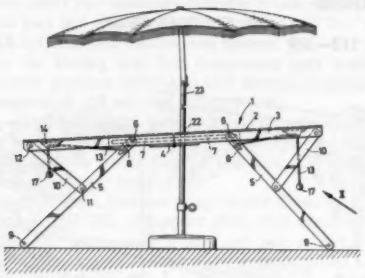
and means including in said reenforcing elements respectively defining each of said second parts.

4,143,602

ADJUSTABLE-HEIGHT ARTICLE OF FURNITURE

Oswald Brunn, Bunzlauer Platz 1, Munich, Fed. Rep. of Germany

Filed Oct. 11, 1977, Ser. No. 840,599
Int. Cl.[2] A47B 3/02
U.S. Cl. 108—117 8 Claims



1. In an adjustable-height article of furniture comprising a generally horizontal top member having longitudinal and transverse dimensions, at least a pair of transversely spaced, elongated leg members each having opposite ends, means for pivotally securing one end of each leg member to said top member at selected longitudinal points thereon, the other end of each leg member being adapted to engage a supporting surface, and a pair of transversely spaced, elongated support members each having opposite ends, one end of each support member being pivotally connected to said top member at a point longitudinally spaced from said selected points, a point on each support member spaced from said one end thereof being pivotally connected to a respective leg member intermediate its ends; the improvement wherein said pivotal securing means comprises means on said top member having a pair of transversely spaced, longitudinally elongated slots formed therein, and a pin element secured to said one end of each leg member and slidably received in a respective slot, and further comprising a pair of elongated flexible elements, each having an end secured to a respective leg member adjacent said one end thereof, and a pair of wedge means on said top member respectively spaced longitudinally from said one ends of said leg members in the direction of said one ends of said support members for receiving and adjustably clamping said flexible elements thereby to secure said one ends of said leg members at an infinite number of selected points along said slots.

4,143,603

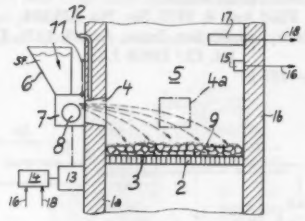
METHOD AND FURNACE FOR COMBUSTION OF PRIMARY FUELS WITH MOISTURE CONTAINING SECONDARY FUELS

Johannes J. Martin; Walter J. Martin, and Horst Kammholz, all of Munich, Fed. Rep. of Germany, assignors to Josef Martin Feuerungsbau GmbH, Munich, Fed. Rep. of Germany

Filed May 31, 1977, Ser. No. 801,657
Claims priority, application Austria, Mar. 6, 1976, 4062/76
Int. Cl.[2] F23G 5/02
U.S. Cl. 110—222 21 Claims

1. A method of combusting a moisture-containing secondary fuel in the chamber of an industrial furnace or the like comprising the steps of establishing and maintaining a body of intensely burning primary fuel; comminuting the secondary fuel so that the comminuted secondary fuel constitutes a viscous mass; and conveying metered quantities of comminuted secondary fuel into contact with the burning body of primary fuel without appreciable changes in the moisture content of comminuted secondary fuel in the course of said conveying step.

11. In a furnace, particularly an industrial furnace, a combustion chamber including wall means having at least one opening; means for supplying to said chamber a primary fuel which forms in said chamber an intensely burning layer; a source of moisture-containing secondary fuel; means for comminuting secondary fuel; and means for conveying comminuted secondary fuel in the form of a viscous mass via said opening onto the burning layer in said chamber without appreciable changes in the moisture content of comminuted secondary fuel intermediate said communiting means and said layer.

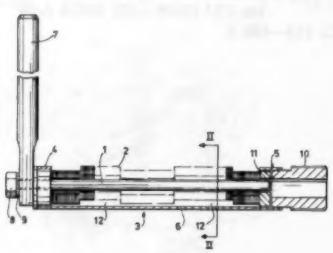


4,143,604

ADJUSTABLE GUIDE DEVICES

Michael O'Keefe, Barnsley, England, assignor to S. R. Gent and Company Limited, Great Britain

Filed Jan. 17, 1978, Ser. No. 870,244
Claims priority, application United Kingdom, Jan. 14, 1977, 1814/77
Int. Cl.[2] D05B 35/10
U.S. Cl. 112—152 8 Claims



1. A guiding device for guiding material of the type specified to a working station and comprising:

an elongate member;

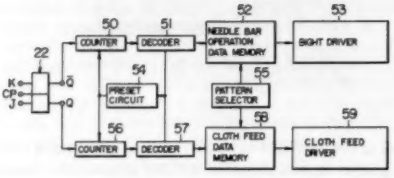
a plurality of thin guide elements each adjustably mounted on said elongate member for movement in a direction transverse to the elongate member whereby selected guide elements can be adjusted in order to define at least one guide passage having a predetermined profile corresponding to the width and depth of the material to be passed therethrough;

and releasable locking means operable when unlocked to allow adjustment of the guide elements to form a guide passage with a predetermined profile and, when locked, to maintain the predetermined profile of the guide passage.

4,143,605
MOTOR DRIVEN SEWING MACHINE

Katsuji Soeda; Fumio Sakuma, and Mitsuhiro Ooyama, all of Sukagawa, Japan, assignors to Yamamoto Electric Industrial Co., Ltd., Fukushima, Japan

Filed Aug. 8, 1977, Ser. No. 823,104
Claims priority, application Japan, Aug. 9, 1976, 51-94589
Int. Cl.[2] D05B *3/02*
U.S. Cl. 112—158 E 6 Claims



1. A motor driven sewing machine comprising:

means for alternately generating a first pulse associated with a predetermined first angular position of the main-shaft of said sewing machine and a second pulse associated with a second predetermined angular position of said main-shaft of said sewing machine;

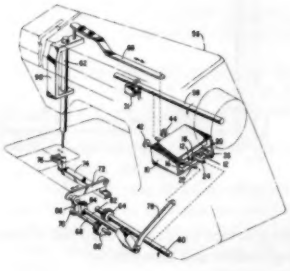
means for alternately changing states between a first and second state in response to said first and second pulses and separately producing a first signal representing said first state and a second signal representing said second state;

a first control means for controlling the needle position in accordance with said first signal; and a second control means for controlling the cloth feed in accordance with said second signal.

4,143,606
MULTIPLE ARMATURE PERMANENT MAGNET MOTOR/ACTUATOR FOR SEWING MACHINE DRIVE AND STITCH CONTROL

John A. Herr, Garwood, and Wolfgang Jaffe, Roselle Park, both of N.J., assignors to The Singer Company, New York, N.Y.

Division of Ser. No. 721,144, Sep. 7, 1976, Pat. No. 4,092,569.
This application Sep. 12, 1977, Ser. No. 832,508
Int. Cl.[2] D05B *3/02*; H02K *1/04*
U.S. Cl. 112—158 E 5 Claims

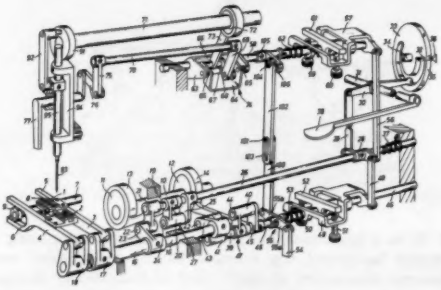


1. In combination with a sewing machine having rotary drive shaft means and reciprocating means for the bight and feed regulating means, a single electric motor having frame means formed of permanent magnet material, permanent magnet means secured to said frame means in spaced opposite polar relationship defining a single air gap therebetween, at least two solid non-magnetic armatures disposed within said single air gap, each of said armatures being individually controllable, and one of the armatures being operatively connected to said rotary drive shaft means and at least one other armature being connected to said reciprocating means.

4,143,607
SEWING MACHINE WITH DIFFERENTIAL WORK TRANSPORT

Walter Hager, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Kaiserslautern, Fed. Rep. of Germany

Filed May 9, 1977, Ser. No. 795,028
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1976, 2625152
Int. Cl.[2] D05B *27/08*
U.S. Cl. 112—209 5 Claims

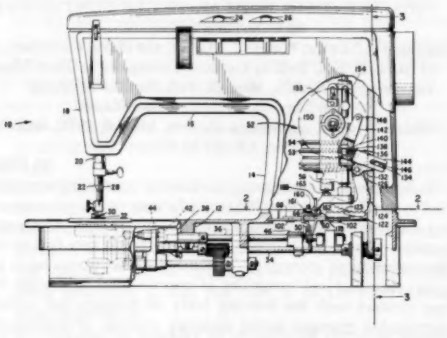


1. In a sewing machine with a differential work transport, consisting of a lower main feed and lower and upper auxiliary feeds, with the step sizes of the auxiliary feeds being adjustable, from a step size substantially in accordance with the step size of the main feed, against the bias of springs, by respective setting devices having associated setting members connected through a lever drive to a common actuating means, the improvement comprising said lever drive interconnecting said setting members of the respective setting devices for said lower and upper auxiliary feeds and being operable to simultaneously vary the step size of said lower and upper auxiliary feeds so that one of said lower and upper auxiliary feeds increases as the other of said lower and upper auxiliary feeds decreases in response to operation of said actuating means.

4,143,608
FEED CONTROL SYSTEM

Lionel J. Coulombe, Matawan, and Edward A. Bruder, Roselle, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Nov. 14, 1977, Ser. No. 850,985
Int. Cl.[2] D05B *27/22*
U.S. Cl. 112—210 4 Claims



1. In a sewing machine having a work feeding mechanism including a means responsive to the angular position of a feed regulating shaft for varying the magnitude and direction of

work feed, manual forward and reverse feed adjusting means for establishing a selected forward feed and a selected reverse feed and a pattern cam system for selectively adjusting forward and reverse feed, a feed control system for operatively interconnecting said manual feed adjusting means and said pattern cam system with said feed regulating shaft comprising:

a composite slider shiftably supported for linear movement, including a first and a second component part, said first component part relatively shiftable to said second component part and operatively connected to said feed regulating shaft and said pattern cam system;

means for biasing said first component part toward one extreme position relative to said second component part representing the selected forward feed;

an operator influenced setting device for selectively applying said manual feed adjusting means to said composite slider for the positioning of said first and said second component parts jointly; and

a manual reverse feed actuating means effective to impart movement to said composite slider first component part relative to said second component part in opposition to said biasing means to a position corresponding with the selected reverse feed.

4,143,609

METHOD OF USING LINKING MACHINES

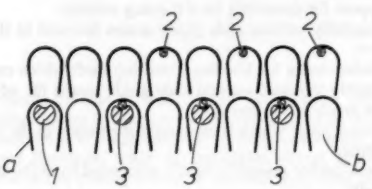
Denis Matthews, Sutton in Ashfield, England, assignor to Mathbirk, Limited, England

Filed Jun. 10, 1977, Ser. No. 805,405

Claims priority, application United Kingdom, Jun. 17, 1976, 25166/76

Int. Cl.[2] D05B *1/00, 7/00*

U.S. Cl. 112—262 **1 Claim**



1. The method of linking fabric on a linking machine having a dial with radially extended points characterised in that the method comprises impaling the fabric to be linked on to said points, operating on the fabric with a first needle adapted to form a single chain stitch by said needle engaging the fabric above and between adjacent points, and operating on the fabric with a second needle adapted to form a single thread chain stitch by said second needle engaging the loops of the fabric impaled on the points.

4,143,610

CONTAINER PROCESSING APPARATUS

Jerry W. Young, Weston, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 18, 1977, Ser. No. 798,049

Int. Cl.[2] B21D *43/00*

U.S. Cl. 113—113 D **12 Claims**

1. An apparatus for rolling a top bead on a container having a side wall and bottom wall, said apparatus including:

a support structure;

a turret rotatably mounted on said support structure;

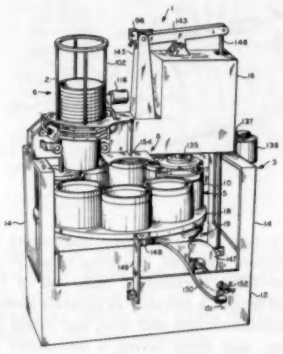
first means operably connected to said turret and being operable for rotating said turret;

a plurality of container receiving receptables mounted on said turret, said receptacles each having an open end;

dispensing means mounted on said support structure and operable for selectively dispensing a container into a receptacle;

a plurality of rings each movably mounted on a respective said receptacle and positioned adjacent the open end thereof, said rings each being movable between first and second positions;

latch means carried by said turret;



a plurality of members each extending between said latch means and a respective said ring and operable to effect cooperation between the latch means and said rings for selectively retaining the rings in a first position;

second means cooperating with said latch means operable for selectively actuating said latch means; and

a bead-forming head means carried by said support structure and being movable linearly and rotationally and being operable for forming a bead on a free edge of a container.

4,143,611

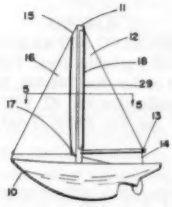
LEEWARDLY ALIGNED SAIL SUPPORT SYSTEM

Thomas S. Hayhurst, 10 Grove St., Ridgefield Park, N.J. 07660

Filed Sep. 8, 1976, Ser. No. 721,446

Int. Cl.[2] B63B *15/00*

U.S. Cl. 114—90 **14 Claims**



1. A sail supporting system which comprises:

(1) a mast having a forward external curved surface with aftwardly diverging flank portions;

(2) a pair of engaging tracks located along the length of the flank portions of said mast substantially at or forward to the greatest width of said mast:

(3) a plurality of sliders engaged in said tracks:

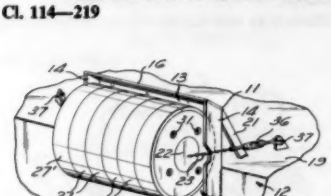
(4) starboard and port filler panels attached at their forward edges to said sliders:

(5) a plurality of flexibility attached stiff crossmembers connecting the aft edges of said filler panels:

(6) an equal plurality of transversely sliding members engaging said cross-members: and

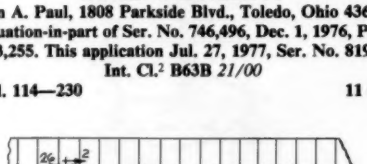
(7) a sail supported along its luff edge by said equal plurality of transversely sliding members.

4,143,612
HEAVY DUTY FENDER
William C. Ticknor, Whittier, Calif., assignor to The Johnson Rubber Company, Middlefield, Ohio
Filed Apr. 14, 1977, Ser. No. 787,313
Int. Cl.[2] F16F 7/12; B63B 59/02
U.S. Cl. 114—219 15 Claims



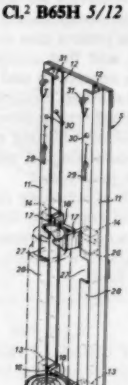
9. A heavy duty fender structure comprising an elongated core of elastomeric material, mounting means in said core and providing mounting portions at each end of said core for mounting said fender, a plurality of separate elastomeric annular discs assembled around said core, and means fastening said discs together, said discs having a substantial resistance to bending whereby substantial portions of the cushioning action of said fender result from radial deflection of the material forming said discs and core, each disc providing an individual outer layer of elastomeric material selected for its properties of non-marking and wear resistance and an individual inner portion formed of elastomeric material of different properties from that of its outer layer and selected for its deformation characteristics, the separate structure of said discs enabling the outer layer and inner portion of each disc to deflect radially substantially independently of the outer layers and inner portions of the other discs when subjected to a radial load.

4,143,613
DOCKING APPARATUS
William A. Paul, 1808 Parkside Blvd., Toledo, Ohio 43607
Continuation-in-part of Ser. No. 746,496, Dec. 1, 1976, Pat. No. 4,073,255. This application Jul. 27, 1977, Ser. No. 819,289
Int. Cl.[2] B63B 21/00
U.S. Cl. 114—230 11 Claims



1. Line-engageable means for aiding in docking a boat to a stationary dock member or the like, said means comprising an arm having a cable and an outer sheath providing stiffness for the cable, and a hook having a hook core of a metal rod including a shank portion, a generally U-shaped portion, and a free end portion, means affixing said shank portion to an end of said cable, and a sheath encasing said hook core and extending beyond the free end portion thereof.

4,143,614
DEVICE FOR MOUNTING A SCREW-RUDDER ON A FLOATING VEHICLE
René H. Jeanson, Auzay, and Daniel Vagner, Fontenay le Conte, both of France, assignors to Societe Anonyme Francaise du Ferodo, Paris, France
Filed Dec. 29, 1077, Ser. No. 865,602
Claims priority, application France, Jan. 7, 1977, 77 00307; Sep. 2, 1977, 77 26652
Int. Cl.[2] B65H 5/12
U.S. Cl. 115—41 HT 12 Claims



1. A device for mounting a screw-rudder on a floating vehicle, comprising:
a support for mounting on a floating vehicle;
substantially vertical slide guide means fastened to the support;
a tubular casing for housing a steering shaft which casing is slidably mounted on said slide guide means for adjusting the depth of the screw;
a steering shaft which is mounted for rotation in the tubular casing;
a screw-carrier assembly rigidly suspended from the steering shaft;
top and bottom slide shoe means slidable in said slide guide means, said tubular casing being mounted on said bottom slide shoe means and being pivotally mounted on said top slide shoe means, and said slide guide means being formed with passages through which said bottom slide shoe means can be released when the tubular casing is raised to lift the screw-carrier assembly from the water; and
power cylinder means connected to the tubular casing and adjustably connected to the support to control as required the sliding of the tubular casing relative to the support and the raising of the tubular casing when said lower slide shoe means is released from the slide guide means through said passages.

4,143,615
ACCELERATION INDICATOR
Ernest J. Nagy, Munster, Ind., assignor to Pullman Incorporated, Chicago, Ill.
Filed Apr. 13, 1978, Ser. No. 895,893
Int. Cl.[2] G01P 15/00
U.S. Cl. 116—46 6 Claims

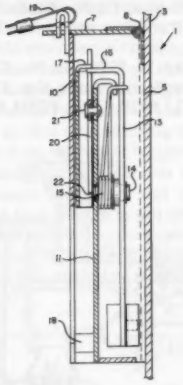
1. For a railway freight car, an improved warning device for indicating the presence of excessive acceleration applied to the car to which the device is adapted to be affixed, comprising;
a housing having an outer plate portion and laterally spaced side walls extending inwardly therefrom and adapted to be affixed to the car,
a vertical mounting plate extending substantially the length

within said housing and inwardly spaced from said outer plate portion and extending between and attached with said side walls in order to reinforce the housing,

first and second pivot means being mounted on said vertical plate and extending in opposite directions therefrom, the axis of said second pivot means being spaced vertically above said first pivot means,

a pendulum having a vertical arm pivotally carried by said first pivot means on one side of the vertical mounting plate intermediate the upper and lower ends of the arm, biasing means fixed relatively to said first pivot means connected with said pendulum and resiliently resisting swinging movement of the pendulum at accelerations below a predetermined magnitude, and retainer means at the upper end of said arm,

an indicating plate between said vertical mounting plate and outer plate portion and guided thereby in vertical movement between a raised position and a lowered position under the influence of gravity,



stop means on said indicating plate cooperative with said retainer means to support it in the raised position when the pendulum is in a substantially vertical position and disengaged therefrom when the pendulum swings against the force of the biasing means to free the indicating plate to drop into the lowered position indicating that excessive acceleration has occurred, and

an eccentrically mounted anti-tampering plate being, mounted on the other side of the vertical mounting plate on said second pivot means for swinging movement in a vertical plane and having a lower portion positioned below said stop means in the raised position of the indicating plate and being engageable with the stop means and rotated thereby as the indicating plate drops into its lowered position, and said lower portion overlying said stop means when the indicating plate is in its lowered position, thereby preventing return of the indicating means to the raised position until said anti-tampering plate is pivoted out of the path of movement of said stop means.

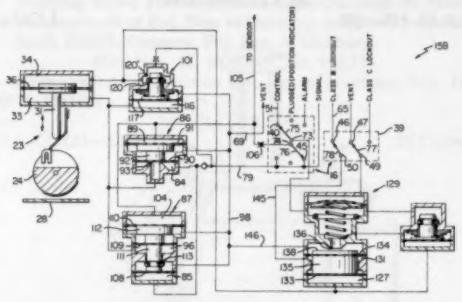
4,143,616

PROCESS MACHINERY CONTROL SYSTEM AND INDIVIDUAL SAFETY CONTROL SYSTEMS THEREFOR OR THE LIKE

Harley V. Bible, Maryville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Continuation of Ser. No. 778,996, Mar. 18, 1977, abandoned.
This application Feb. 24, 1978, Ser. No. 880,761
Int. Cl.[2] F16K *37/00*; G08B *1/04*
U.S. Cl. 116—266 **60 Claims**

1. A selectively changeable pneumatic control safety system for monitoring the start-up and running of process machinery, said system having a pneumatically operated indicator, pneumatically operated means for operating said indicator, and selector means for setting said pneumatically operated means to any one of a plurality of different monitoring conditions thereof which monitors a respective variable of said process machinery and will operate said indicator to indicate an unsafe



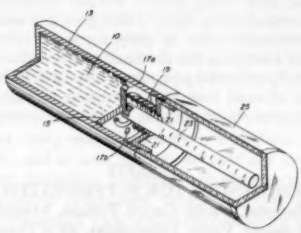
condition thereof, said selector means comprising selector plate means having port means therein and manually adjustable fluid switching means carried by said plate means for selectively interconnecting various port means thereof together to provide a selected monitoring condition.

4,143,617

ROCKET MOTOR LIFE INDICATOR

Fred R. Youngren, Lexington, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Feb. 16, 1977, Ser. No. 771,059
Int. Cl.[2] G01K *1/02*
U.S. Cl. 73—358 **3 Claims**



1. For use as an indicator of the stability of solid fuel in a rocket motor, such fuel being susceptible to instability after being subjected to elevated temperatures over an extended period of time, the combination comprising:

(a) a mass of a material having a viscosity inversely related to the temperature of such material, such material being a mixture of waxes having different melting points, such mixture being 75% a wax with a melting point at 165° F, 20% a wax with a melting point between 150° F and 160° F and 5% a wax with a melting point between 143° F and 150° F;

(b) a chamber for holding the mass in a confined space adjacent to a rocket motor having solid fuel;

(c) first means springily connected to the chamber and in contact with the mass, such means being adapted to move only in accordance with any decrease in viscosity of the material in the mass; and

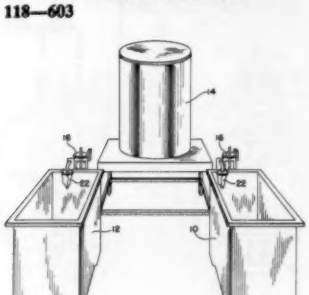
(d) second means connected to the first means for indicating the position of the first means, such second means thereby also indicating the stability of the solid fuel in the rocket motor.

4,143,618

ELECTROLESS NICKEL PLATING APPARATUS

Evo Del Vecchio, 2 Worcester St., Clinton, Mass. 01510

Filed Apr. 14, 1978, Ser. No. 896,310
Int. Cl.[2] B05C *3/04*
U.S. Cl. 118—603 **1 Claim**



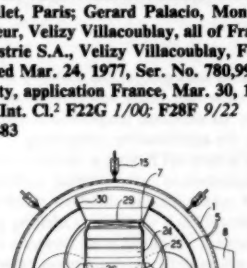
1. Apparatus for electroless plating comprising:
a pair of plating tanks;
a drain for each tank;
a pump operatively associated with each drain;
a disposable filter bag located within each tank at the opening thereof;
means operatively connecting said disposable filter bags, drains, pumps and tanks whereby plating solution may be pumped from each tank to the other to effect alternative use of the plating tanks;
a source of cleaning fluid;
means for selectively communicating said source with said tanks whereby one tank may be cleaned while the other tank plates;
said tanks each comprising a cellular urethane having an exterior reinforcing layer of fiberglass and an interior rigid and removable liner of polypropylene having a flange element overlying the urethane and fiberglass edges; and
a branched perforated pipe means disposed within and at the bottom of each tank and connected to a pressurized air supply whereby to provide an agitator means.

4,143,619

HEAT EXCHANGER FOR SUPERHEATING STEAM

Jacques Marjollet, Paris; Gerard Palacio, Montmorency, and Gerard Tondeur, Velizy Villacoublay, all of France, assignors to Stein Industrie S.A., Velizy Villacoublay, France

Filed Mar. 24, 1977, Ser. No. 780,997
Claims priority, application France, Mar. 30, 1976, 76 09191
Int. Cl.[2] F22G *1/00*; F28F *9/22*
U.S. Cl. 122—483 **8 Claims**



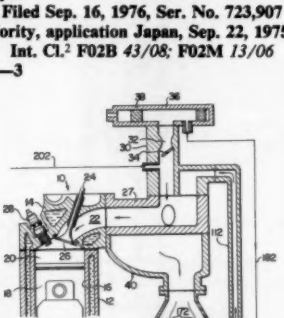
1. A device for drying and superheating steam and supplying it to a load, comprising: a cylindrical outer casing with a horizontal axis and a coaxial inner sleeve leaving an outer space in which flows superheated steam, the steam to be superheated flowing inside said inner sleeve, said inner sleeve including parallel to its axis:
(a) a separator with baffle plates for removing water from the emulsion of water and steam to be superheated in the lower part of said sleeve;
(b) nests of tubes comprising a superheater in the upper part of said sleeve; and
(c) pipe means connecting said cylindrical outer casing to said load from at least one side opening of said cylindrical outer casing near said load; said outer casing being only in contact with dry superheated steam at a constant temperature along substantially its entire length for preventing corrosion and asymmetrical horizontal deformation.

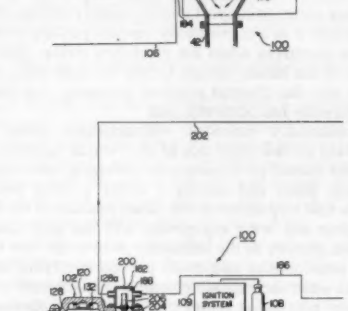
4,143,620

FUEL REFORMING SYSTEM

Masaaki Noguchi, Nagoya; Tsuchio Bunda, Okazaki, and Taro Tanaka, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Sep. 16, 1976, Ser. No. 723,907
Claims priority, application Japan, Sep. 22, 1975, 50-115311
Int. Cl.[2] F02B *43/08*; F02M *13/06*
U.S. Cl. 123—3 **11 Claims**





1. A fuel reforming system for converting a mixture of air and a fuel into a reformed gaseous mixture rich with free hydrogen and feeding the reformed gaseous mixture into an internal combustion engine, said system comprising:
a fuel circuit having a downstream end adapted to be connected to an internal combustion engine;
a carburetor disposed in said fuel circuit for producing a rich mixture of air and the fuel at an air-fuel ratio smaller than the stoichiometric air-fuel ratio of the mixture;
said carburetor including a primary air intake passage, means

providing a venturi in said air intake passage, means for feeding the fuel into said venturi substantially in proportion to the flow of air through said venturi to cooperate therewith to produce the rich air-fuel mixture, and a secondary air intake passage bypassing said venturi and connected to said fuel circuit downstream of said venturi for supplying a secondary air to the rich air-fuel mixture produced in said venturi;

ignition means disposed in said fuel circuit downstream of said carburetor and being adapted to be operated, when required, to ignite and burn the air-fuel mixture in said fuel circuit;

a reactor vessel disposed in said fuel circuit and containing therein a catalyst for facilitating a catalytic reformation of said rich air-fuel mixture into said reformed gaseous mixture, said catalyst being disposed in heat exchange relationship with engine exhaust gases; and

air-fuel ratio adjusting means mounted on said carburetor and being operative in response to the variation in the temperature of said reactor vessel to vary the cross-sectional area of said secondary air intake passage for thereby controlling the air-fuel ratio of said rich air-fuel mixture so that when said temperature is not high enough to activate said catalyst, the air-fuel ratio of the rich mixture controlled by said air-fuel ratio adjusting means is controlled to allow a part of the mixture to be ignited by said ignition means to produce heat which raises the temperature of said reactor vessel, and when said temperature in the reactor vessel is high enough to activate said catalyst, the mixture is further enriched to the extent that the temperature is not further increased above a point where the reformation is substantially at a maximum.

4,143,621

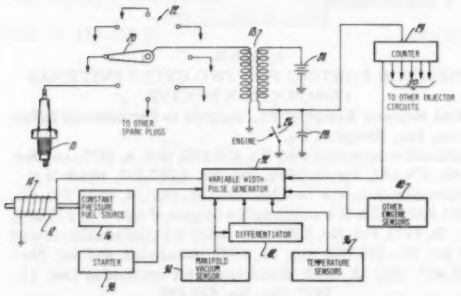
FUEL INJECTION SYSTEM WITH AUGMENTED TEMPERATURE SENSITIVE FUEL ENRICHMENT FOR TRANSIENT ENGINE LOADS

E. David Long, Elmira, N.Y., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Oct. 1, 1976, Ser. No. 728,822

Int. Cl.[2] F02B *3/02*

U.S. Cl. 123—32 EG **12 Claims**



1. In a fuel injection system for a spark ignited, internal combustion engine including at least one fuel injector, means for sensing the engine manifold vacuum, means for sensing the engine operating temperature, and means for providing a quantity of fuel enrichment to the engine, an improvement comprising: means for augmenting the quantity of fuel enrichment provided to the engine during engine warm-up as a direct function of the rate of decrease of manifold vacuum and as an inverse function of engine operating temperature.

4,143,622

FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINES

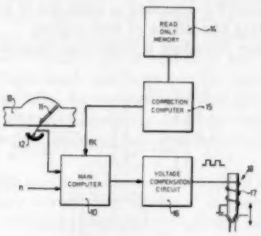
Winfried Klötzner, Schwieberdingen; Rolf Däumer, Merklingen; Wolfgang Busse, Hildesheim, and Hans-Christoph du Mont, Renningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 17, 1976, Ser. No. 742,720

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1975, 2551688

Int. Cl.[2] F02B *3/02*

U.S. Cl. 123—32 EC **22 Claims**



1. A fuel injection apparatus for internal combustion engines, having fuel injection valves and control means for generating fuel injection control pulses to control said fuel injection valves, said control means including:

a main computer and means for supplying to said main computer data relating to the prevailing engine speed and air flow rate for the purpose of changing the duration of said fuel injection pulses;

a central memory containing digitally coded information related to each operational engine variable;

a correction computer for receiving the digital information from said central memory and for generating therefrom a correction frequency to be applied to said main computer for the adjustment of said fuel injection control pulses, said correction computer including at least two auxiliary memories (19, 25, 30, 34) for receiving the digital data in said central memory depending on the external engine variables and in multiplex sequence, each of said auxiliary memories being associated with a numerical frequency converter, and at least one pair of auxiliary memory and associated numerical frequency converter constituting a first corrective sub-system which receives a constant counting frequency from which the correcting sub-system generates a correction frequency in consideration of the information stored in the auxiliary memory and said apparatus including at least one other correcting sub-system consisting of an auxiliary memory and an associated numerical frequency converter, said other correcting sub-system receiving the output correction frequency of said first correcting sub-system for performing a renewed alteration of said frequency in dependence on the digital information being stored in the auxiliary memory; whereby at least two correcting sub-systems in said correcting computer are connected in functional series.

4,143,623

AIR-TO-FUEL RATIO FEEDBACK CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Hideaki Norimatsu, and Mitsuo Nakamura, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 9, 1977, Ser. No. 794,930

Claims priority, application Japan, Jun. 18, 1976, 51-72527

Int. Cl.[2] F02B *3/08*; F02M *7/12*; F01N *3/08*

U.S. Cl. 123—32 EE **7 Claims**

1. In combination with an engine having a mixture supply controller adapted to supply air-fuel mixture in accordance

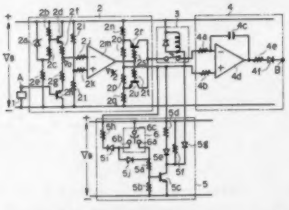
with the operating conditions of said engine, air-to-fuel ratio feedback control system comprising:

sensor means, positioned in the exhaust passage of said engine, for detecting the presence and absence of oxygen in exhaust gases;

integrator means, connected between said sensor means and said mixture supply controller, for generating an integrator output signal in response to which said mixture supply controller corrects the air-to-fuel ratio of said air-fuel mixture to be stoichiometric, said integrator output signal changing the output level thereof in response to the sensor output signal of said sensor means so long as said sensor output signal is applied;

detector means for detecting at least one of accelerating and decelerating conditions of said engine;

cut off means including a switching element which is rendered nonconductive by said detector means while said at least one condition is detected, said switching element cutting off said sensor output signal during nonconductive thereof so that said integrator output signal dependent on said sensor output signal of said sensor means is memorized; and



control means responsive to said detector means for either increasing or decreasing said memorized integrator output signal by a predetermined value at the start of said at least one of conditions and for oppositely decreasing or increasing said increased or decreased integrator output signal by said predetermined value at the end of said at least one of conditions, whereby the air-to-fuel ratio of said air-fuel mixture is controlled at a value other than the stoichiometry in response to said increased or decreased integration output signal while said at least one of conditions is detected.

4,143,624

SPARK-IGNITED RECIPROCATING-PISTON INTERNAL COMBUSTION ENGINE

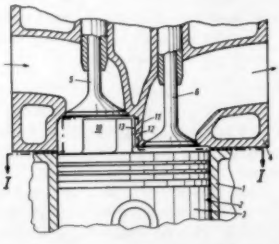
Karl-Walter Schmidt, Weinstadt, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 17, 1976, Ser. No. 751,716

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1975, 2556720

Int. Cl.² F02B *23/08*; F02F *3/28*

U.S. Cl. 123—32 B **10 Claims**



1. Spark-ignited reciprocating-piston internal combustion engine with a combustion chamber subdivided in the top dead center zone into a first and second chamber located at respective opposite sides of the piston, between which the first and second chambers a cross connection exits extending along a curved path adjacent the periphery of the piston rim, the first chamber being associated with a source of ignition and forming a combustion duct between the source of ignition and the cross connection, wherein means are provided for assuring that initiation of ignition at said source of ignition takes place only after the piston and cylinder are in respective positions separating the combustion chamber into the two chambers whereby propagation of the flame front is assured from a position adjacent the source of ignition in the first chamber through the cross connection and into the second chamber.

4,143,625

INJECTION VALVE FOR INTERNAL COMBUSTION ENGINES

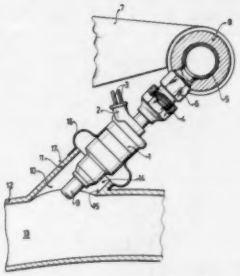
Günter Kulke, Esslingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 31, 1977, Ser. No. 847,299

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1976, 2653674

Int. Cl.² F02M *53/04*

U.S. Cl. 123—32 R **4 Claims**



1. An injection valve for electromagnetically controlled feed of fuel into an intake duct of an internal combustion engine, said valve being supported by sealing means in means defining an aperture in said intake duct, the further improvement wherein:

said injection valve which includes an exterior wall is supported freely within said means defining said aperture by a bellows means.

4,143,626

INJECTOR PORTING FOR TWO CYCLE INTERNAL COMBUSTION ENGINE

Eyvind Boyesen, Kempton, Pa., assignor to Performance Industries, Inc., Kempton, Pa.

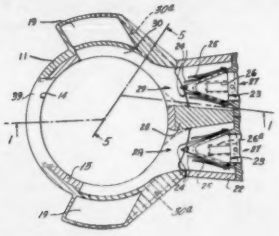
Continuation-in-part of Ser. No. 839,180, Oct. 4, 1977, and Ser. No. 674,102, Apr. 6, 1976, Pat. No. 4,062,331, which is a continuation-in-part of Ser. No. 586,138, Jun. 11, 1975, Pat. No. 4,051,820, which is a continuation-in-part of Ser. No. 375,065, Jun. 29, 1973, Pat. No. 3,905,340, which is a continuation-in-part of Ser. No. 282,734, Aug. 22, 1972, abandoned, and Ser. No. 361,407, May 18, 1973, abandoned. This application Dec. 12, 1977, Ser. No. 859,476

Int. Cl.² F02B *33/04*

U.S. Cl. 123—73 A **17 Claims**

1. A variable speed, two-cycle crankcase compression, internal combustion engine, comprising: engine housing structure including a cylinder and a crankcase, a piston mounted for reciprocation in the cylinder between top and bottom dead center positions; transfer passage means in communication with the crankcase and having porting through the cylinder wall for supplying, to the combustion side of the piston, fluid compressed in the crankcase during movement of the piston

toward its bottom dead center position; a fuel intake chamber for receiving fuel from a supply source, and having intake porting in the housing structure positioned to deliver fuel to the space below the piston including the crankcase, said intake porting including portions configured and positioned to provide for introduction of fuel beneath the piston and into said space independently of the transfer passage means throughout the entire upward stroke of the piston, from substantially the bottom dead center position to substantially the top dead center position thereof; reed valve means for controlling the flow of fluid through the intake chamber and substantially preventing flow of fluid back toward such supply source during down-



ward movement of the piston toward its bottom dead center position; and injector passage means connected with the intake chamber and with said transfer passage means for delivering fuel directly to the combustion side of the piston without compression in the crankcase, said injector passage means including two passages each in communication with said intake chamber downstream of said reed valve means, a first of the injector passages communicating with the transfer passage means immediately adjacent the transfer porting through the cylinder wall, and the second of the injector passages communicating with the injector passage means in a region spaced from the transfer porting through the cylinder wall.

4,143,627

INTERNAL COMBUSTION ENGINE

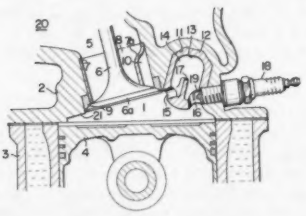
Masaaki Noguchi, Nagoya; Masaharu Sumiyoshi, Toyota; Yukiyasu Tanaka, Okazaki, and Taro Tanaka, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Apr. 4, 1977, Ser. No. 784,370

Claims priority, application Japan, Apr. 6, 1976, 51-38448; Apr. 14, 1976, 51-42698; Apr. 29, 1976, 51-48909

Int. Cl.[2] F02M *23/00*

U.S. Cl. 123—75 B **18 Claims**



1. An internal combustion engine comprising:

a cylinder;

a piston slidably disposed within said cylinder;

a cylinder head;

a main combustion chamber defined between said cylinder head and the top surface of said piston;

an intake port through which an air-fuel mixture flows into said main combustion chamber;

an intake valve for adjusting the mixture flowing into said main combustion chamber through said intake port;

an auxiliary combustion chamber defined in said cylinder head;

a plurality of torch apertures interconnecting said main and auxiliary combustion chambers;

said auxiliary combustion chamber being, before a combustion stroke of said engine, supplied through one of said torch apertures with an amount of the air-fuel mixture for pre-combustion therein, said auxiliary chamber being scavenged during an intake stroke of a succeeding cycle of the engine in such a way that the air-fuel mixture is introduced into said auxiliary chamber through said one of said torch apertures, guided into a deep area of said auxiliary chamber and directed to another of said torch apertures, pushing out a residual gas in said deep area through said another of said torch apertures into the main chamber so that substantially no residual gas remains behind said another of said torch apertures which is located at the end of a path from said one to said another of said torch apertures; and

a spark plug for causing the pre-combustion of the mixture in said auxiliary combustion chamber to thereby generate torch jets which are directed through said torch apertures into said main combustion chamber to ignite the mixture therein, said spark plug igniting the mixture around said electrodes in said another of said torch apertures propagating a combustion flame into both the deep area of said auxiliary chamber and said main chamber, said flame igniting the air-fuel mixture in said deep area to spurt a combustion flame as torch jets through all of said torch apertures.

4,143,628

METHOD AND MEANS FOR INCREASING THE MEAN EFFICIENCY OF AN OTTO CYCLE ENGINE

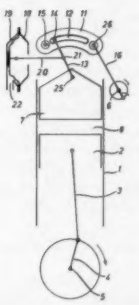
Erik A. Gustavsson, Skarblacka, Sweden, assignor to Skarblacka Bil- & Motor AB, Skarblacka, Sweden

Filed Feb. 22, 1977, Ser. No. 770,654

Claims priority, application Sweden, Feb. 24, 1976, 7602179

Int. Cl.[2] F02B *75/04*

U.S. Cl. 123—78 A **6 Claims**



1. A method of increasing the mean efficiency of an Otto cycle engine having a driving piston movably disposed within a cylinder, said method comprising the steps of:

a. providing an opposing piston within said cylinder above the driving piston to define a delimited compression chamber above a top and outermost position of the driving piston, and

b. varying the volume of said compression chamber cyclically with a frequency fixedly interrealted to the working cycle of the engine and with an amplitude interrelated to the load under which the engine is operating,

c. said varying step being effective to vary the compression

ratio causing the compression to remain substantially the same with different loading of said engines,

d. the opposing piston executes a motion controlled by the motion of the driving piston,

e. the movement of the opposing piston is controlled such that the effective working space in the cylinder is a minimum and has a constant volume at the beginning of the induction stroke for any load.

4,143,629

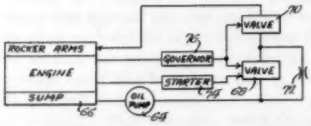
SPEED CONTROLLED HYDRAULIC LIFTER FOR INTERNAL COMBUSTION ENGINES

Alexander Goloff, East Peoria; Frank E. Keske, Chillicothe; Darrell E. Stafford, and Michael K. Stratton, both of Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 17, 1977, Ser. No. 760,070

Int. Cl.[2] F01L *1/24*

U.S. Cl. 123—90.16 **3 Claims**



1. An internal combustion engine comprising:

at least one cylinder defining a combustion chamber;

a piston reciprocable within said cylinder;

at least one port in said combustion chamber;

a valve within said port and movable between positions opening and closing said port;

a camshaft;

a valve train operated by said camshaft for moving said valve between said positions;

said valve train including a hydraulic valve lifter;

means for supplying oil to said hydraulic valve lifter; and

means for at least partially interrupting the supply of oil to said hydraulic valve lifter to at least partially starve the valve lifter of oil thereby intentionally introducing lash into said valve train for predetermined operational conditions of said engine, said interrupting means comprising an oil control valve and means responsive to the speed of the engine for operating said control valve, said operating means causing said control valve to close to at least partially interrupt the supply of oil; and

an oil flow restriction in bypass relation to said control valve.

4,143,630

ALTITUDE INSENSITIVE AUTOMOTIVE ENGINE INGNITION TIMING CONTROL

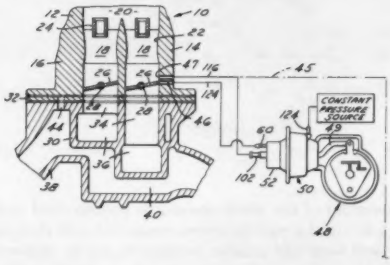
Ahmet R. Akman, Farmington, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 14, 1977, Ser. No. 851,241

Int. Cl.[2] F02P *5/04;* **F02M** *25/06*

U.S. Cl. 123—117 A **10 Claims**

1. An altitude insensitive ignition timing control for an automotive type internal combustion engine having a carburetor mounted thereon having an induction passage connected to the engine intake manifold and a throttle valve movable across the passage to control the flow of an air/fuel mixture therethrough to the intake manifold, first and second pressure ports opening into the passage axially spaced from one another along the passage and one of which is located above the closed position of the throttle valve in a position to be traversed by the edge of the throttle valve as it moves between a closed and open position to subject the one pressure port to manifold vacuum changes, an engine ignition timing distributor having movable ignition timing change means movable in an advance direction from an initial timing set position to advance the ignition timing and in an opposite direction to return the ignition timing to the set position, a source of constant pressure, and fluid pressure actuated control means connected to said movable means and responsive to the application of the pressures from the pressure ports to move the distributor movable means to effect an advance of the engine timing by various degrees, said control means comprising a servo mechanism having first and second separated vacuum chambers with first and second movable walls, respectively, each wall operatively connected



to the distributor movable means, means connecting the first and second pressure ports respectively to the first and second chambers to act on one side of each of the first and second movable walls, respectively, whereby application of vacuum from the ports to the chambers moves the movable walls as a function of the vacuum changes to independently and/or concurrently advance the engine timing by an amount that varies as a function of the pressures in the ports, first and second spring means biasing the first and second movable walls, respectively, towards the initial set position, and means connecting the constant pressure source to the opposite side of at least one of the movable wall means whereby the one wall means maintains the same position attained for the same level of vacuum applied to the wall means regardless of barometric pressure changes in response to altitude changes.

4,143,631

APPARATUS FOR REGULATING THE COMPOSITION OF THE OPERATING MIXTURE OF AN INTERNAL COMBUSTION ENGINE

Gerhard Stumpp, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 21, 1977, Ser. No. 863,003

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658051

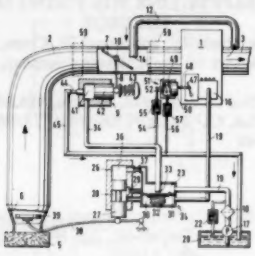
Int. Cl.[2] F02M *25/06, 63/00, 7/00*

U.S. Cl. 123—119 A **3 Claims**

1. In a fuel injection system of an internal combustion engine, comprising: a fuel reservoir; a fuel injection pump having a fuel rate adjusting member; a fuel supply pump; a fuel supply line connected to the fuel supply pump, and the fuel injection pump through which fuel is delivered by the fuel supply pump to the fuel injection pump; a throttle member; an air flow rate meter connected to the throttle member, said throttle member being actuated by the air flow rate meter according to the inlet air flow drawn into the engine, said throttle member being connected also to the fuel supply line and defining a fuel metering cross section; a differential pressure valve connected to the fuel supply line and the throttle member, said differential pressure valve having a controlled pressure chamber and an uncontrolled pressure chamber, located respectively upstream and downstream of the metering cross section; a throttle plate

mounted in the induction tube of the engine downstream of the air flow rate meter; a servo-motor having an adjusting member connected to the throttle plate and defining an operating chamber; a pressure relief line having a throttled end, said pressure relief line having its throttled end connected with the controlled chamber of the pressure differential valve and its other end connected with the operating chamber of the servo-motor; and a device for regulating the composition of the operating mixture of the engine, the improvement in said regulating device, comprising:

a pump defining a pump chamber within which a piston is displaceable;



a suction line connected to the pump chamber and the fuel reservoir;

a check valve positioned in the suction line, and closing in the direction of the fuel reservoir;

a pressure line connected to the pump chamber and the operating chamber of the servo-motor; and

a check valve positioned in the pressure line and closing in the direction of the pump chamber, said pump piston being coupled with the fuel rate adjusting member of the fuel injection pump.

4,143,632

FUEL INJECTION TIMING CONTROL DEVICE

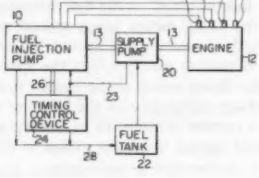
Masayoshi Kobayashi, Matsuyama, Japan, assignor to Diesel Kiki Company, Ltd., Tokyo, Japan

Filed Jul. 21, 1976, Ser. No. 707,401

Claims priority, application Japan, Jul. 26, 1975, 50-103478[U]

Int. Cl.[2] F02M *61/06, 63/00, 45/00*

U.S. Cl. 123—139 AQ **5 Claims**



1. A fuel injection timing control device comprising:

a timing control member movable between a minimum timing advance position and a maximum timing advance position;

a first piston connected to said timing control member such that the position of said timing control member corresponds to the position of the first piston;

a first biasing means urging said first piston and thereby said timing control member toward the minimum advance position;

a pressure passageway communicating with said first piston such that fluid under pressure in said pressure passageway urges said first piston and thereby said timing control member toward the maximum advance position;

a second piston engageable with said first piston;

a second biasing means urging said second piston to engage with said first piston so as to urge said first piston and thereby said timing control member toward the maximum advance position, said pressure passageway communicating with said second piston such that fluid under pressure in said pressure passageway urges said second piston to disengage from said first piston;

said first biasing means imposing a first preload biasing force on said first piston and said second biasing means imposing a second preload biasing force on said second piston such that fluid under pressure in said pressure passageway just sufficient to overcome the first preload biasing force is greater than fluid under pressure in said pressure passageway just sufficient to overcome the second preload biasing force.

4,143,633

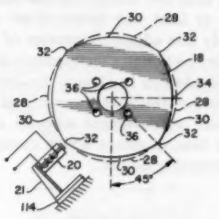
CRANKSHAFT TRIGGER WHEEL

Gordon H. Peck, Las Cruces, N. Mex., assignor to Autotronic Controls Corporation, El Paso, Tex.

Filed Jan. 31, 1977, Ser. No. 764,417

Int. Cl.[2] F02P *1/02;* **H02K** *39/00*

U.S. Cl. 123—148 E **8 Claims**



1. In an internal combustion engine having an ignition system which fires a spark plug of each combustion chamber thereof in timed sequence respective to the position of the crankshaft, the combination with said ignition system of a crankshaft trigger wheel by which a timed signal is generated for causing the ignition system to sequentially fire each spark plug;

said trigger wheel is concentrically received in attached relationship respective to one end of the crankshaft with the central axis of the wheel coinciding with the central axis of the crankshaft;

said trigger wheel having an outermost, circumferentially extending surface area defined by a plurality of intersecting arcs, said arcs being arranged adjacent to one another, each arc having a radius which is greater than the radius generated when the wheel is rotated about its central axis to thereby provide a corner at the termination of each arc;

the radius of curvature of the intersecting arcs for a given maximum radial deviation and wheel maximum diameter is of a value such that the intersection of said adjacent arcs falls upon the radius of the circle generated when the wheel is rotated about its axial centerline; said maximum radial deviation is equal to 0.02 to 0.9 inches;

a pickup coil, means mounting said coil adjacent to the outer periphery of the wheel such that rotation of the wheel successively brings each corner thereof into close proximity of said coil to thereby induce a varying voltage thereinto as the wheel is rotated about its central axis.

4,143,634
RPM GOVERNOR FOR FUEL INJECTION ENGINES

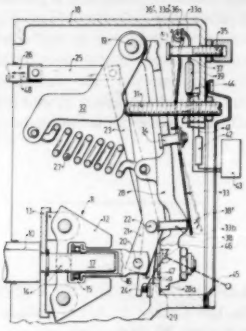
Ernst Ritter, and Reinhard Schwartz, both of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 23, 1977, Ser. No. 836,183

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1976, 2644994

Int. Cl.[2] F02D *1/04*

U.S. Cl. 123—179 L **7 Claims**



1. An rpm governor for fuel injection internal combustion engines, having a housing, an rpm-dependent regulating member including at least one idling and one main control spring associated with at least one intermediate lever adapted to influence a supply rate adjusting member of the fuel injection device, and further including a temperature dependent correcting device that is adapted to change the tension of the idling control spring and a thermostat associated with said idling spring, the further improvement wherein said thermostat is provided with a heating means which controls the operating period of the correcting device.

4,143,635
EXHAUST GAS RECIRCULATED ENGINE WITH VARIABLE CYLINDER DISABLEMENT CONTROL

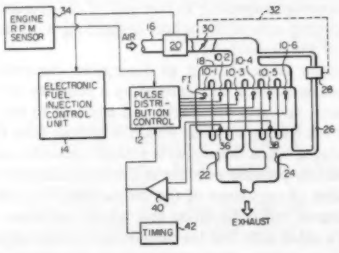
Haruhiko Iizuka, and Seishi Yasuhara, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Dec. 6, 1977, Ser. No. 858,011

Claims priority, application Japan, Dec. 8, 1976, 51-146602

Int. Cl.[2] F02D *17/02*; F02B *75/10*

U.S. Cl. 123—198 F **6 Claims**



1. A multi-cylinder internal combustion engine having first and second cylinders, first and second electrically energizable fuel injectors respectively for said cylinders adapted when energized to discharge fuel thereinto, means for generating electrical pulses for energizing said fuel injectors, and air intake passage means including a throttle valve, comprising in combination:

first and second exhaust passage means respectively for said first and second cylinders;

exhaust gas recirculation passage means connected between said second exhaust passage means and said air intake passage means including a control valve responsive to vacuum depression upstream from said throttle valve;

means for sensing the magnitude of load exerted upon said engine; and

means for disabling said first fuel injector in response to the detected magnitude of engine load.

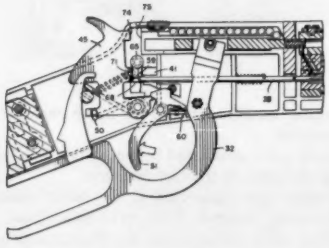
4,143,636
GUN WITH SAFETY LINK FOR FIRING MECHANISM THEREOF

Sigurds Liepins, Rushville, and James W. Crane, Fairport, both of N.Y., assignors to The Coleman Company, Inc., Wichita, Kans.

Filed Jul. 12, 1977, Ser. No. 814,897

Int. Cl.[2] F41B *11/06*; F41C *17/08*

U.S. Cl. 124—40 **7 Claims**



1. In a gun having a frame, a hammer, a trigger, and firing means operable by movement of the hammer for firing the gun, a shaft mounted on the frame, the trigger being pivotally mounted on the shaft for pivoting movement between rest and fired positions, the hammer being pivotally mounted on the frame for movement between cocked and fired positions, the gun including a hammer spring for biasing the hammer toward its fired position and sear means for releasing the hammer from its cocked position when the trigger moves to its fired position, an improved safety link assembly for preventing firing of the gun unless the trigger is pulled comprising a link mounting member pivotally mounted on the shaft independently of the trigger and having a trigger-engaging portion engageable with the trigger as the trigger pivots from its rest position to its fired position for pivoting the link mounting member on the shaft, and a hammer link mounted on the link mounting member, the hammer and the firing means being spaced apart when the hammer is in its fired position, the hammer link being pivotable with the link mounting member into the space between the hammer and the firing means as the trigger moves to its fired position and being engageable by the hammer as the hammer moves from its cocked position to its fired position whereby the link is forced against the firing means to fire the gun.

4,143,637
DRESSING DEVICE FOR PLATE-SHAPED GRINDING WHEELS OF A GEAR TOOTH FLANK-GRINDING MACHINE

Milton M. Mesey, Wallisellen, Switzerland, assignor to Maag Gear-Wheel & Machine Co. Ltd., Zurich, Switzerland

Filed Sep. 6, 1977, Ser. No. 830,877

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1976, 2644890

Int. Cl.[2] B24B *53/04*

U.S. Cl. 125—11 CC **4 Claims**

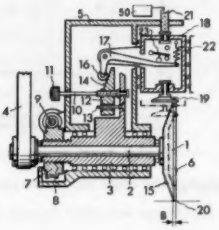
1. A dressing device for dressing an outer peripheral surface of a substantially dished grinding wheel, said outer peripheral

surface having a width and lying between an end grinding surface and a rear surface, at least part of said rear surface being inclined and serving for a tooth flank-grinding machine, comprising:

a dressing tool for said outer peripheral surface;

drive means for radially feeding said dressing tool for dressing the outer surface of the grinding wheel;

means for axially feeding said grinding wheel such that said end grinding surface lies essentially in a predetermined plane;



measuring means for measuring the axial feed movement of the grinding wheel and the radial feed movement of the dressing tool;

control means controlling the drive means for the radial feed movement in such a manner that the relationship thereof to the axial feed movement of the grinding wheel is equivalent to the tangent of the angle between the inclined part of said rear surface of the grinding wheel and its lengthwise axis for preventing the width of said outer surface of said grinding wheel from falling below a predetermined value as the end grinding face of said grinding wheel wears during the tooth flank-grinding operation.

4,143,638

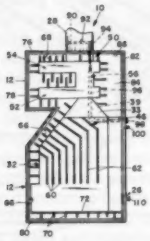
FIREPLACE HEAT EXCHANGE SYSTEM

Gordon E. Kamstra, 4555 E. Paris SE., Grand Rapids, Mich. 49508, and Robert J. Powers, 5225 76th St., SE., Caledonia, Mich. 49316

Filed May 23, 1977, Ser. No. 799,597

Int. Cl.[2] F24B *7/00*

U.S. Cl. 126—121 **13 Claims**



4. A fireplace heating unit within which a fuel may be burned and which is connectable to a forced air system of a building, comprising:

a housing having a front wall, sidewalls, a rear wall, a top wall and a bottom wall, said front wall having an opening therein, said housing having an inlet in one wall and an outlet in another wall;

a firebox positioned within said housing so as to define with said housing a heat exchange space, said firebox including sidewalls, a rear wall, a bottom wall, an open front and plenum means positioned on top of said firebox for defining a chamber within which combustion gases may be collected;

a plurality of heat exchange fin means on the exterior of said firebox, said fin means positioned to define channels through which air entering said housing inlet passes for guiding the air over and around said firebox through said heat exchange space and for increasing the rate of heat transfer from said firebox to said air;

closure means positioned at the open front of said firebox and the front wall opening of said housing for closing said open front and said front wall opening;

combustion air control means at said housing front wall opening for controlling the amount of combustion air entering said firebox;

chimney means connected to said firebox plenum for directing combustion gases out of said firebox; and

damper means positioned within said chimney means for controlling combustion gas flowing out of said chimney means whereby said combustion air control means and said damper means may regulate the amount of combustion air entering said firebox so that combustion is maintained and air passing from said housing inlet to said housing outlet will be heated before entering the existing forced air heating system, said rear wall of said firebox including a first portion extending vertically and a second portion angled towards the open front so as to define, with said sidewalls, a smoke dome of decreasing cross section area, said smoke dome opening into said plenum means, said plenum means including:

a first portion defining a first chamber connected to said smoke dome;

a vertical transfer portion having a horizontal cross-sectional area less than that of said first portion; and

a second portion defining a second chamber communicating with said first chamber through said transfer portion.

4,143,639

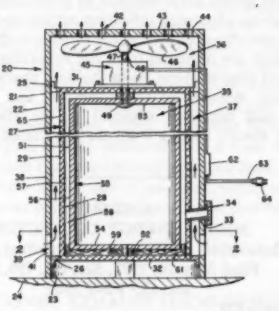
FRICTION HEAT SPACE HEATER

Eugene J. Frenette, Box 255, Derry, N.H. 03038

Filed Aug. 22, 1977, Ser. No. 826,557

Int. Cl.[2] F24C *9/00*

U.S. Cl. 126—247 **8 Claims**



1. An odor-less, combustion-less, quiet beater comprising:

an inner, elongated, upstanding, hollow drum journalled within an outer, elongated, upstanding, hollow drum journalled within an outer, elongated upstanding drum to rotate in a horizontal plane on a vertical axis;

said inner drum having an outer, circumferential face spaced from the inner circumferential face of said outer drum by a fixed clearance of about one eighth of an inch to define an annular liquid receptacle therewith;

said inner drum having a lower diametrical face spaced from the lower diametrical face of said outer drum to define a shallow liquid receptacle therewith;

a supply of oil normally occupying only said shallow liquid receptacle but adapted to be raised upwardly into said annular liquid receptacle when said inner drum is rotated on said vertical axis at substantial speed;

and electric motor means for rotating said inner drum on said vertical axis within said outer drum to heat said oil and transfer heat to the outer face of said outer drum.

4,143,640

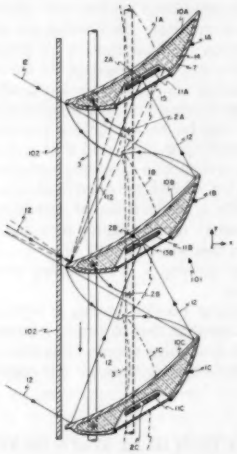
VENETIAN-BLIND SOLAR COLLECTOR

Norton T. Pierce, Concord, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 575,767, May 8, 1975, abandoned. This application Mar. 31, 1977, Ser. No. 783,117

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—270 **17 Claims**



1. A venetian-blind solar collector that comprises, in combination: a plurality of slat-like members spaced on generally parallel axes, respective supporting unit means at each end of the plurality of slat-like members to receive said members operative to permit each member to pivot about its axis each member having a focusing reflecting surface at one side thereof and a heat absorbing surface at the other side thereof such that the sun's rays are reflected from the reflecting surface of one member and concentrated upon the heat absorbing surface of the adjacent member of the collector, and heat exchange means in said members adjacent to the absorbing surface thereof, to absorb energy from the associated heat absorbing surface.

4,143,641

SOLAR ENERGY COLLECTOR

John C. Christopher, 68 Charlonne St., Jaffrey, N.H. 03452

Filed May 20, 1977, Ser. No. 799,113

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—270 **9 Claims**

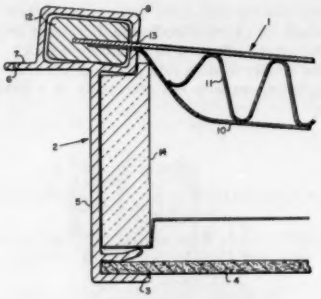
1. A solar energy collector comprising:

A. a box-like structure including side walls, a chassis back panel and an open top;

B. a substantially rectangular cover panel assembly for totally covering said open top and being capable of transmitting solar energy and having an edge rail along two opposing edges thereof, each of said edge rails comprising a protrusion or deformation and forming the edge of said cover panel;

C. a solar energy absorber panel, approximately co-extensive with the cover panel assembly and positioned within said collector;

D. two of said side walls being defined by opposing structural chassis side wall members, each having an upper channel portion with an opening along one side of the channel portion, the openings of said chassis side wall members being positioned to face each other to support the cover panel therebetween, each of said channels being of suitable interior dimension to enclose and retain but



non-rigidly engage the edge rail of the cover panel assembly.

4,143,642

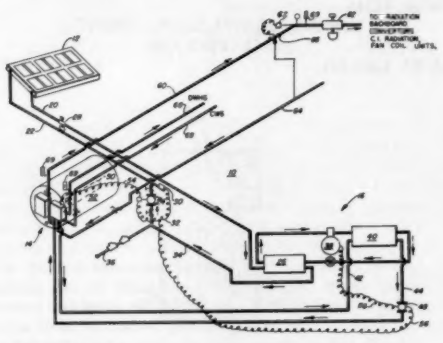
HIGH TEMPERATURE THERMAL STORAGE SYSTEM UTILIZING SOLAR ENERGY UNITS

Adrian A. Beaulieu, West Bridgewater, Mass., assignor to Vapor Corporation, Chicago, Ill.

Filed Sep. 24, 1976, Ser. No. 726,060

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—271 **20 Claims**



1. In combination

means for collecting solar energy and heating a first circulating fluid,

first means for exchanging heat from said first fluid to a second fluid,

means for elevating the temperature of said second fluid to a preselected level higher than said first fluid,

second means for exchanging heat from said second fluid to a third fluid, and

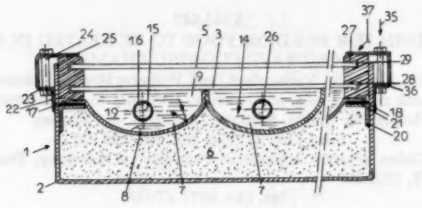
a storage means for storing said third fluid at a preselected pressure above that of its atmospheric boiling point, and means associated with said storage means for maintaining said third fluid at a preselected temperature above its atmospheric boiling point.

4,143,643

SOLAR HEAT TRAP WITH DOUBLE FLUID CIRCUITS

Albert A. Gerin, 7 rue des Ecoles, and Claude G. Blanc, 5 rue du Moulin, both of Vinay (Isere), France

Filed Feb. 14, 1977, Ser. No. 768,212
Claims priority, application France, Nov. 6, 1976, 76 34055
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 9 Claims



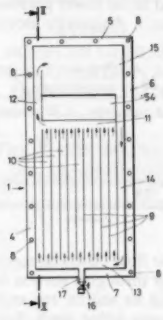
1. A solar heat energy collector apparatus comprising:
a container;
reflecting surface means mounted within said container, said reflective surface means comprising:
a top side;
a bottom side opposite said top side; and
peripheral edge means sealingly mounted to said container;
means for thermally insulating said reflective surface means from said container, said insulating means being in continuous contact with said bottom side of said reflective surface means;
transparent sealing means mounted to said container in spaced relationship to said reflecting surface means such that the apparatus disposed within said container is sealed, said transparent sealing means and said reflective surface means defining a first fluid chamber;
conduit means interposed between said transparent sealing means and said reflective surface means, said conduit means defining a second fluid chamber;
means for mounting said transparent sealing means to said container, said reflecting surface means comprises:
a plurality of geometrically formed compartments mounted side to side within said container, any two of said side by side mounted geometrically formed compartments having at least one juxtaposed edge in sealed communication with said transparent sealing means, said plurality of compartments each having inlet means; outlet means; and each compartment having at least one optical focal axis, said inlet means and outlet means communicating with said plurality of geometrically formed compartments to define a first fluid circuit;
said conduit means further comprises:
a plurality of tubular elements having inlet and outlet means, said plurality of tubular elements being within said plurality of compartments, each compartment having at least one tubular element mounted coaxially with said optical focal axis of said geometrically formed compartment, said inlet means, outlet means and plurality of tubular elements forming at least one network of tubes, defining a second fluid circuit, said network of tubes being blackened to absorb the solar calorific energy concentrated by said reflecting surface means on said plurality of tubular elements such that each tubular element in said first fluid circuit acts like a heating rod for the fluid circulating in said first fluid chamber;
means for mounting said plurality of tubular elements to said plurality of compartments;
wherein said fluid is a liquid and said inlet means of said plurality of tubular elements is coaxial with said inlet means of said plurality of geometrically formed compartments; and wherein, said outlet means of said plurality of tubular elements is coaxial with said outlet means of said plurality of geometrically formed compartments.

4,143,644

APPARATUS FOR PRODUCING USEFUL HEAT FROM SOLAR RADIATION

Herbert Heitland; Rudolf Kroll, and Edgard Grundmann, all of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jun. 2, 1977, Ser. No. 802,961
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1977, 2626182
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 12 Claims



1. Apparatus for producing useful heat from solar radiation and which in the operating position is oriented in an inclined plane comprising: a coilable conduit structure provided with an inlet and an outlet for a flowable heat carrier medium, said conduit structure being formed of two elongated flexible foils, of which at least one is colored so as to absorb solar radiation, which are sealingly connected together along their edge regions and are sealingly connected together along lines in their center regions to form a plurality of parallel flow channels which extend in the longitudinal direction of said foils and first and second transverse flow channels which connect the respective adjacent ends of said parallel flow channels together; a reservoir for the flowable heat carrier medium; first means for connecting said first transverse flow channel, which in the operating position of the apparatus is the upper transverse flow channel, with an upper region of said reservoir; second means for connecting said second transverse flow channel, which in the operating position is the lower transverse flow channel, with a lower region of said reservoir; and a hose for the removal of the heated heat carried medium, said hose extending into said reservoir with the end of said hose which is disposed inside said reservoir being freely movable and provided with a float.

4,143,645

SELF-CONTAINED EXHAUST HOOD WITH HEAT EXCHANGER AND METHOD OF EXHAUSTING AIR

Sidney Blumberg, 3440 W. Hollywood, Chicago, Ill. 60659

Continuation of Ser. No. 707,430, Jul. 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 578,619, Jul. 25, 1975, abandoned. This application Sep. 29, 1977, Ser. No. 837,940
Int. Cl.[2] F24C *15/20*
U.S. Cl. 126—299 D 1 Claim

1. An exhaust system for the removal of heated, fouled air from a defined work area in a room having air tempering equipment, and having a source of said fouled air located in said defined work area, comprising:
a hood structure defining a central, downwardly open space, and first and second chambers adjacent said central space forwardly and rearwardly thereof, respectively;
means for supplying make-up air to said hood structure at a first predetermined rate;
said first chamber being in communication with said make-

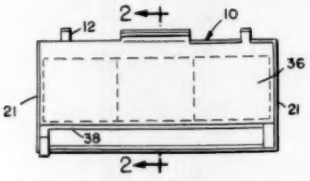
up air supply means, and having a heat-insulated front wall and a heat-conducting rear wall;

means for exhausting the mixture of make-up air and fouled air from said hood structure at a second predetermined rate;

said second chamber being in communication with said exhausting means and having an upwardly and forwardly slanted front wall, and also being in communication with said central space through an aperture in the last-mentioned front wall; and

means in said second chamber for removing contaminants from said mixture of make-up air and fouled air;

there being provided in the lower portion of the rear wall of said first chamber a diagonally downwardly and rearwardly inclined air flow directing means for projecting all of said make-up air through a portion of said central space toward said fouled air source, the angle of inclination of said directing means being such that said make-up air mixes with the rising heated, fouled air in a zone located below said bottom plane but at a substantial distance above said fouled air source and that the mixture, upon re-entering said central space, in part passes through said removing means to said exhausting means and, to another part, circulates along the upwardly and forwardly slanted front wall of said second chamber towards and along said heat-conducting rear wall of said first chamber so as to pre-heat the make-up air passing through said first chamber.

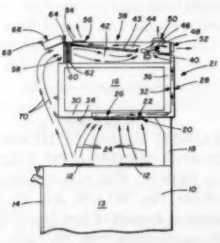


4,143,646

COOKING APPARATUS AND EXHAUST SYSTEM

Kenneth E. Sampsel, Dallas, Tex., assignor to Home Metal Products Company a Division of Mobex Corporation, Plano, Tex.

Filed Oct. 27, 1977, Ser. No. 846,169
Int. Cl.[2] F24C *15/20*
U.S. Cl. 126—299 D **13 Claims**



1. A cooking apparatus and exhaust system comprising:

a stove top including at least one burner,

an eye-level oven,

means for supporting the eye-level oven above the stove top,

inlet port means mounted on the bottom of the eye-level oven above the stove top,

horizontal duct means extending from the inlet port means rearwardly along the bottom of the eye-level oven,

vertical duct means connected at one end to receive gases from the horizontal duct means and extending along the rear wall of the eye-level oven,

housing means mounted on the top of the eye-level oven and having an intake port and at least one discharge port, said intake port being connected to receive gases from the vertical duct means, and

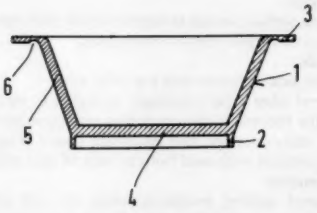
means for drawing gases from the region between the stove top and the eye-level oven into the inlet port means, through horizontal and vertical duct means and through the intake port of the housing, and for forcing said gases out the discharge port of the housing.

4,143,647

DISH FOR HOLDING FOOD TO BE HEATED IN A MICROWAVE COOKING CHAMBER

Julius Husslein, Vachendorf, and Wilhelm Hertel, Traunreut, both of Fed. Rep. of Germany, assignors to Bosch-Siemens Hausgeräte GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 1, 1976, Ser. No. 746,335
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1975, 2555344
Int. Cl.[2] A47J *27/00*
U.S. Cl. 126—390 **1 Claim**



1. A dish for holding food to be heated in a microwave cooking chamber comprising a dish bowl of a single material free from coatings with high absorption of high-frequency radiation whereby both the dish bowl and the food contained in the dish bowl when placed in a microwave cooking chamber are heated by absorption of high-frequency radiation in the microwave cooking chamber to the extent that there is no, or only a small thermal gradient between the heated food and the dish material thus protecting the food against rapidly cooling down, and a handle of the same material free from coatings as the dish bowl extending from and integral with said dish bowl, said handle having a thin wall relative to a thick wall for the dish bowl resulting in low absorption of high-frequency radiation whereby said handle remains cool when said dish is placed in the microwave cooking chamber and can be touched by the bare hand, and a base of the same material free from coatings as the dish bowl at the bottom of and integral with said dish bowl, said base having a thin wall relative to the thick wall for the dish bowl resulting in low absorption of high-frequency radiation whereby said base remains cool when said dish is placed in the microwave cooking chamber and can be placed on a table without burning or causing excessive thermal stress of the set-down surface of the table.

4,143,648

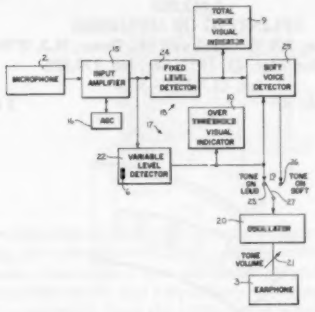
PORTABLE THERAPEUTIC APPARATUS HAVING PATIENT RESPONSIVE FEEDBACK MEANS

Ronald S. Cohen, and James M. Dawley, both of Milwaukee, Wis., assignors to Behavioral Controls, Inc., Milwaukee, Wis.

Filed Apr. 13, 1977, Ser. No. 787,064
Int. Cl.[2] A61B *19/00*; G09B *19/04*
U.S. Cl. 128—1 R **8 Claims**

2. A portable therapeutic apparatus for providing instantaneous feedback to a patient in response to patient behavior, comprising a pick-up means for attachment to the patient and producing a behavioral signal in response to the monitored behavior, a first signal channel having a signal detector connected to said pick-up means including an adjustable level

control and responsive to said behavioral signal above said selected level to produce a detector signal, signal processing means to convert said detector signal to a first constant level signal defining a first feedback signal, a second signal channel having a signal detector connected to said pick-up means and responsive to said behavioral signal to produce a second detector signal in the presence of said behavior, said second channel having signal processing means to convert said second detector signal to a second constant level signal defining a second



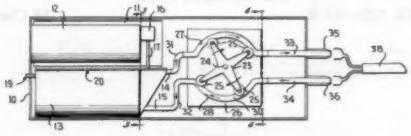
feedback signal, said first and second constant level signals being of an opposite potential, logic circuit means connected to the first and second channels for producing a third feedback signal only in response to the combination of said second constant level signal in the absence of said first constant level signal, feedback means for generating a detectable signal to the patient, and switch means selectively connecting said first channel and said logic circuit means to said feedback means for activating said feedback means in response to said first or third feedback signals.

4,143,649

PUMP FOR CLOSED CIRCULATION SYSTEM

George Foti, 1212 Port Washington Blvd., Port Washington, N.Y. 11050

Filed Jan. 24, 1977, Ser. No. 762,437
Int. Cl.² A61B *19/00*
U.S. Cl. 128—2 N **33 Claims**



1. A self-contained caloric liquid circulating system for use in a closed cycle, caloric nystagmus inducing system that includes an ear probe having caloric liquid inlet and outlet ports and a fluid flow path within the probe between the probe ports, comprising:

a hand-manipulable housing having caloric liquid inlet and outlet ports for communicating with said probe outlet and inlet ports respectively through suitable conduits,

a caloric liquid reservoir for containing a supply of nystagmus inducing caloric liquid within the housing, the reservoir being normally closed except for liquid inlet and outlet openings,

means providing communication between the housing inlet and outlet ports and the reservoir inlet and outlet openings,

a pump for causing circulation of caloric liquid between the reservoir and the housing inlet and outlet ports,

means located within the housing for driving the pump,

means for normally positively preventing caloric liquid flow to or from the reservoir through the housing inlet and outlet ports when the reservoir contains caloric liquid and the circulating system is inoperative,

temperature adjusting means within the housing for adjusting the temperature of the caloric liquid,

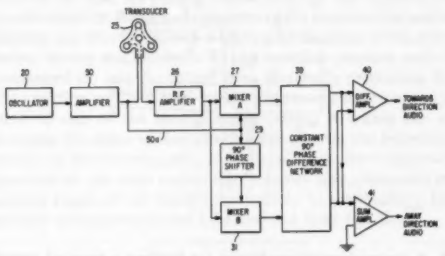
said temperature adjusting means comprising means for cooling the caloric liquid, including a container of refrigerant material within the housing, a coolant conduit for carrying refrigerant in heat exchange relationship with the caloric liquid, and valve means for regulating the flow of refrigerant material through the coolant conduit.

4,143,650

DIRECTIONAL DOPPLER ULTRASOUND SYSTEMS FOR BIOSIGNAL ACQUISITION AND METHOD OF USING THE SAME

Fred L. Hatke, Skillman, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 6, 1976, Ser. No. 730,111
Int. Cl.² A61B *5/02*
U.S. Cl. 128—2.05 Z **20 Claims**



17. An ultrasonic directional doppler fetal cardiac monitoring system for extracting at least a first unique repetitive event of the fetal cardiac cycle from the composite doppler ultrasound return signals, comprising first means for obtaining from said return signals doppler signal information representative of motion of at least a portion of a fetal cardiac valve, second means for differentiating between components of said doppler signal information representative of motion of said cardiac valve in at least two directions, and third means for selecting those components associated to one of said directions based upon a pre-established criterion.

4,143,651

CATHETER

Bhupendra C. Patel, Elgin, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Nov. 3, 1977, Ser. No. 848,169
Int. Cl.² A61M *25/00*
U.S. Cl. 128—349 B **22 Claims**

1. A catheter, comprising:

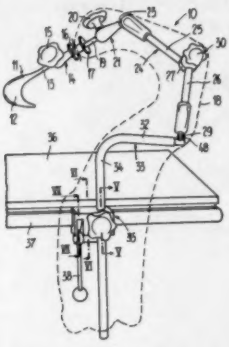
an elongated inner first tube defining a main lumen;

an elongated annular sleeve of elastic material covering a longitudinal portion of the first tube;

an elongated outer second tube covering a longitudinal portion of said sleeve and having a distal end proximally spaced from a distal end of said sleeve to define an inflat-

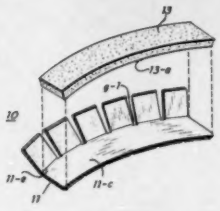
able segment of the sleeve intermediate the distal end of the second tube and the distal end of the sleeve;
means for securing the distal end of the sleeve to the first tube; and
means for establishing communication with said inflatable sleeve segment for inflation thereof.

4,143,652
SURGICAL RETAINING DEVICE
Hans Meier, Bahnhofstrasse 13, 5507 Mellingen, and Jaroslav Dbaly, Jupiterstrasse 55, 3015 Bern, both of Switzerland
Filed Jan. 24, 1977, Ser. No. 762,140
Claims priority, application Switzerland, Jan. 29, 1976, 1099/76
Int. Cl.[2] A61B *17/02*
U.S. Cl. 128—20 **8 Claims**



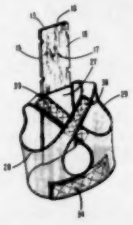
1. A surgical retaining device for holding a surgical instrument in place, especially a wound hook, comprising:
a holder block assembly including means for displaceably securing the surgical retaining device along a stationary guide rail;
at least one instrument receiving element at which there can be inserted and fixedly clamped the surgical instrument;
means for interconnecting the holder block assembly and the instrument receiving element with one another;
said interconnecting means comprising:
a double-arm pivotable stand, equipped with an intermediate pin joint arranged between the instrument receiving element and the holder block;
said pivotable stand having a first end and a second end;
a ball-and-socket joint for connecting said first end of said pivotable stand with the instrument receiving element;
overhang arm means carried by said holder block including a first and second end portion;
a further ball-and-socket joint for connecting the second end of the pivotable stand to said overhang arm means;
said holder block assembly comprising:
a fixed clamp jaw and a pivotable clamp jaw for engaging said rail; rotatable cam means for actuating said pivotable clamp jaw; means for rotating said cam means; a substantially vertical bore and a transverse bore intersecting said vertical bore; a thrust sleeve having a longitudinal bore displaceably arranged in said transverse bore; tightening means for displacing said thrust sleeve with respect to said vertical bore;
said overhang first end portion being adapted to be introduced into said vertical bore and through said longitudinal bore to be blocked in its elevational position by displacement of said thrust sleeve by said tightening means; said first end portion comprising an outwardly open longitudinal groove;
a displaceable sleeve member having a longitudinal bore surrounding said overhang first end portion; a key member secured within said sleeve bore and engaging said longitudinal groove of said overhang;
said displaceable sleeve member comprising at its periphery a toothed rim, the space between two adjacent teeth of said rim being adapted to engage a pin secured to said holder block assembly and thus to block said overhang first end portion in its rotational position with respect to the holder block assembly.

4,143,653
SPLINTING OF MEMBERS
Heins Wichman, 369 W. Blackwell St., Dover, N.J. 07801
Filed Mar. 21, 1977, Ser. No. 779,506
Int. Cl.[2] A61F *5/04*
U.S. Cl. 128—87 A **2 Claims**



1. A splint for providing lateral and vertical support to an injured member comprising
a base strip having an edge bounding opposed surfaces and being bendable into a desired configuration according to the support required for said member; and
a plurality of individual projections having base portions positioned at the end of said base strip and extending upwardly therefrom;
each projection being separated at its base portion from an adjoining projection by a gap which extends to a groove on the outer surface of said base strip;
thereby to facilitate the shaping of said base strip and its reduction to a desired size.

4,143,654
UNIVERSAL SHORT SPINE BOARD SYSTEM
Samuel W. Sherman, R.F.D., West Tisbury, Mass. 02575
Filed May 26, 1977, Ser. No. 800,707
Int. Cl.[2] A61F *5/04*
U.S. Cl. 128—87 R **11 Claims**

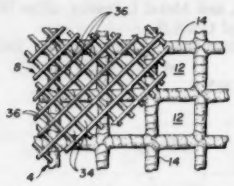


1. Spine board system capable of reversiblity for use in connection with a patient having a cervical injury comprising in combination a short spine board for positioning against a patient's back of sufficient width to bridge the hollow of the patient's back so as not to exert undue pressure on the patient's spinal column, and having a lower portion for supporting a patient's back and an upper portion for supporting a patient's head and a body conforming vest comprising side portions conforming to said patient's body and, a back portion intermediate said side portions, a pocket in said back portion for containing the spine board during use of the spine board system.

4,143,655
METHOD AND APPARATUS FOR APPLYING HEAT SOFTENABLE ORTHOPEDIC CAST

Milton F. Custer, Livermore, and Carol J. Laufenberg, Pleasanton, both of Calif., assignors to Hexcel Corporation, San Francisco, Calif.

Filed Aug. 22, 1977, Ser. No. 826,437
Int. Cl.[2] A61F 5/04
U.S. Cl. 128—90 31 Claims

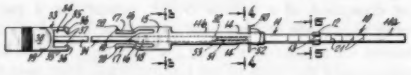


1. In a bandage assembly for forming a lightweight orthopedic cast, the assembly including a carrier material defining a multitude of openings; a heat softenable polymer composition applied to the carrier; and a separator constructed of a material which is releasable from the composition when the composition is softened by heat, the material, the composition and the separator being rolled up to define said assembly so that the separator separates adjoining convolutions of the material, the improvement to the separator comprising: a length of separator material having a multitude of passageways distributed substantially fully over its surface area so that a fluid medium can circulate through the passageways of the rolled up material to facilitate the heating of the assembly with such fluid medium preparatory to the formation of an orthopedic cast with the material.

4,143,656
INSTRUMENT AND METHOD FOR INSERTING AN INTRAUTERINE CONTRACEPTIVE DEVICE

Gordon W. Holmes, Mississauga, Canada, assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Continuation of Ser. No. 781,592, Mar. 28, 1977, abandoned. This application Apr. 7, 1978, Ser. No. 894,312
Int. Cl.[2] A61F 5/46
U.S. Cl. 128—130 12 Claims



1. An insertion instrument for inserting into the uterus an intrauterine device having a stem and at least one substantially horizontally extending flexible arm comprising

(a) an inserter tube adapted to protectively house said intrauterine device with the arm or arms folded adjacent to the stem in an axially aligned position, said tube having an insertion section of a flexible nature and an manipulative section of a non-flexible nature, said tube having (i) an externally mounted slidable stop means for engaging the cervical os, said stop means being located on the insertion section of the tube, said stop mean susceptible of adjustment to a predetermined position for insertion, (ii) a pair of diametrically opposed axially extending apertures located on the manipulative section of the tube posteriorly of the stop means, said apertures adapted to receive the intrauterine device so that the stem extends axially within the tube and the arm or arms extend through said apertures; and

(iii) a handle at the posterior end of the tube, said handle being an integral part of the manipulative section and having a passageway therethrough, said passageway in communication with the lumen of the tube and further being bifurcated with the stems and terminating in a flange with a projecting edge; and

(b) a coacting rod of malleable material with a retentive memory in telescopic relationship to the inserter tube and slidable therein, said rod having (i) a tubular receptacle section at the insertion end adapted to support the stem of the intrauterine device and (ii) a handle at the posterior end, said handle being bifurcated with stems extending in an anterior or forward direction and and having flanges with edges projecting oppositely to that in the handle of the inserter tube, said flanges further being spatially opposed and abuttable with the flanges of the inserter tube handle;

wherein the lumen in the manipulative section of the tube and the coacting rod have a non-circular cross-setional configuration;

wherein the stems of one of the bifurcated handles is compressible and when compressed is adapted to be received in the area between the stems of the other handle; and

wherein said tube and said rod are adaptable to coacting in a manner so that (i) pulling rearwardly on the inserter tube handle until the flanges of the stems of the inserter tube and rod handles are abutting causes a folding of the arms of the intrauterine device and moves it to the insertion position with the contoured tip and the folded arms minimally projecting from the insertion end of the tube, (ii) compressing the compressible stem of one of the handles and drawing it within the area between the stems of the other handle releases the intrauterine device at the insertion end, and (iii) releasing the compression pressure on the stem causes the inwardly and outwardly projecting edges of the handle susceptible to interlocking for a unitary withdrawal of the tube and rod from the uterus.

4,143,657
EARPLUG

Hidetaka Takeda, 4,18, Shirogane 1-chome,, Chuo-ku, Fukuoka-shi, Fukuoka, Japan

Filed May 19, 1977, Ser. No. 798,503
Int. Cl.[2] A61F 11/02
U.S. Cl. 128—152 8 Claims

1. An earplug comprising a plug body formed of a relatively flexible material to fit within the auditory canal and having a longitudinally extending zigzag shaped passage therethrough extending from a sound inlet to a sound outlet, said zigzag-shaped passage having the same diameter throughout said plug body from the sound inlet to the sound outlet, said zigzag-shaped passage including more than two turns.

4,143,658
INTRATRACHEAL INJECTION SYSTEM FOR ANIMALS

G. Phillip Rambosek, Maplewood, and Charles G. Thiel, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

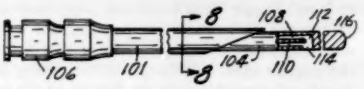
Continuation of Ser. No. 597,545, Jul. 21, 1975, abandoned, which is a division of Ser. No. 505,668, Sep. 13, 1974, Pat. No. 3,915,165. This application Feb. 24, 1977, Ser. No. 771,476
Int. Cl.[2] A61M 5/32
U.S. Cl. 128—184 1 Claim

1. In combination:

a catheter needle comprising a hollow tube with a beveled end for penetrating the skin of an animal to project the beveled end into the trachea; and

a needle fitting through said catheter needle comprising an

elongated rod-like member terminating at one end in a blunt tip, said needle having a first closed passageway extending lengthwise through said rod-like member for transmitting gas-propelled dry medicament and terminating at an end wall spaced a sufficient distance from said blunt tip to insure that said end wall is positioned near the center of the trachea when the blunt tip engages the wall of the trachea, said end wall defining an impinging surface



for breaking up agglomerates of dry medicament, and a second closed passageway parallel to said first closed passageway, said parallel passageways communicating with each other immediately adjacent to said end wall so that materials passing through said passageways are mixed, and said rod-like member having a single side port communicating directly with said passageways and said end wall for directionally discharging dry medicament propelled through said passageways into the trachea.

4,143,659

STILLIGOUT OR DROPPER PARTICULARLY FOR INFUSION APPARATUS

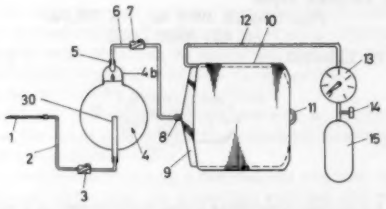
Helmut Biedermann, Erzherzog-Eugenstrasse 19, Innsbruck, Austria (A-6020)

Filed Aug. 25, 1976, Ser. No. 717,692

Claims priority, application Austria, Aug. 28, 1975, 6639/75; Apr. 24, 1976, 3795/76

Int. Cl.[2] A61M *05/16*

U.S. Cl. 128—214 C **27 Claims**



1. A drip chamber for determining the rate of flow of a liquid comprising, a dropper housing defining an interior dropper chamber, an inlet tube connected into the top of said dropper chamber, an outlet tube extending well into said chamber on an opposite side of said inlet tube to a point less than half the distance across said chamber on an axis aligned with said inlet tube, said outlet tube having an outlet opening at an end within said chamber for venting the air and exiting the liquid of said interior chamber, said inlet tube extending into said chamber to a distance less than said outlet tube, said chamber being fillable upon inverting said dropper housing, the liquid fed through said inlet tube up to said outlet opening, the liquid surface and a portion of said chamber defining a first volume of air, said first volume being smaller than each further volume defined by a liquid surface tangent to said outlet opening and a remaining portion of said chamber in any other orientation of the dropper housing, said first volume being larger than the smallest volume defined by a liquid surface which tangents the inlet opening and a remaining portion of said chamber, so when the dropper housing is placed back in an upright position after filling, the liquid surface is at a safety level above the outlet opening.

4,143,660

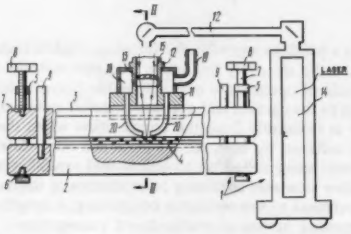
METHOD OF SURGERY MAKING USE OF LASER EMISSION AND AN APPARATUS FOR ACCOMPLISHING SAME

Boris N. Malyshev, ulitsa Butlerova, 24, kv. 219; Viktor A. Saljuk, Teply Stan, I mikroraion, korpus 7, kv. 153; Oleg K. Skobelkin, ulitsa Vesnina, 30, kv. 27; Robert A. Toschakov, ulitsa Konstantinova, 12, kv. 31; Evgeny I. Brekhov, Rezervny proezd, 8, kv. 230, all of Moscow; Evgeny I. Egorov, Leninsky raion, poselok Dubrovsky, ulitsa Vostochnaya, 33, Moskovskaya oblast, and Alexei I. Ivanov, ulitsa Blagoeva, 38, kv. 1, Kalinin, all of U.S.S.R.

Filed May 9, 1977, Ser. No. 795,025

Int. Cl.[2] A61B *17/36*

U.S. Cl. 128—303.1 **10 Claims**



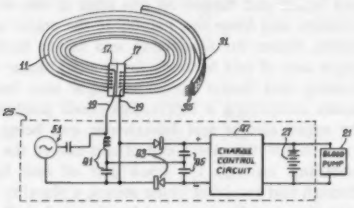
1. A method of surgery on hollow organs making use of a laser beam moving along a line of intended section of said hollow organ, comprising the steps of compressing a hollow organ from two sides so that the opposite walls of said organ join each other along the intended line of section, the degree of compression of said walls of the hollow organ along said section line being within the range from 1/5 to ½ from the initial thickness of its wall; then simultaneously dissecting said organ along the intended line of section and welding the edges of the formed cavities of said hollow organ through the movement of a focused laser beam along the line of section.

3. A surgical laser for implementing a method of surgery making use of a focused laser beam moved along an intended line of dissection of a hollow organ, comprising a pair of clamping jaws made of a material impermeable to laser radiation means for adjustably moving the jaws together and apart for compressing the walls of the hollow organ from two sides along an intended line of section; said jaws being mounted on said means for moving; one of said jaws including a guide path thereon; a carriage movable mounted on the guide path provided on said one of said jaws and made of a material impermeable to laser radiation, said carriage including a through-slot; a laser with a light guide, the entry section of said light guide being joined to the laser and its exit section including a focusing lens and being provided in said through-slot and a through-slot in said one of said jaws including said guide path and clamping surface for the passage of the laser beam to the area of said hollow organ clamped in said jaws, the walls of said jaw through-slot having a mirror surface with a high reflection coefficient, reflecting the laser beam, the other of said jaws provided with a groove on the clamping surface thereof in the area of compressing said hollow organ and situated opposite said jaw through-slot, and having a diffuse-scattering surface with a high-reflection coefficient; said walls of said through-slots and groove defining, upon the compression of said hollow organ in said jaws, a closed channel for the passage of the laser beam exclusively to said compressed area of said hollow organ.

4,143,661
POWER SUPPLY FOR BODY IMPLANT AND METHOD FOR OPERATION

David H. LaForge, Kensington, and Peer M. Portner, Berkeley, both of Calif., assignors to Andros Incorporated, Berkeley, Calif.

Filed Dec. 12, 1977, Ser. No. 859,914
Int. Cl.[2] A61N 1/00
U.S. Cl. 128—419 R 12 Claims



1. A power supply system for an electric-powered device which is implanted within a living body, which system comprises

a secondary coil in the form of at least one turn of electrically conductive wire disposed within a biocompatible outer covering, which coil is of a size and configuration for subcutaneously encircling a major member of the living body, said coil further being of a size and configuration for location close to the exterior skin along at least a major portion of the length of said coil,

a storage battery adapted for implantation within the living body,

means for electrically interconnecting said secondary coil and said storage battery, and means for connecting said storage battery to the electric-powered device for supplying energy thereto,

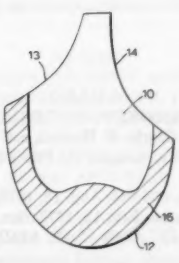
a primary coil in the form of an encircling belt having a width greater than the width of said secondary coil and being proportioned to fit around the exterior of the major member in radial alignment with said secondary coil, and

an external power source in electrical connection with said primary coil which is operable to transcutaneously supply sufficient power, via said primary and secondary coils, to charge said implanted storage battery for operation of said implanted device.

4,143,662
BRASSIERE

Marlene J. Fisher, 18 Edinborough Ct., Apt. 5, Toronto, Ontario, Canada (M6N 2E8)

Filed Jun. 6, 1977, Ser. No. 804,143
Claims priority, application United Kingdom, Jun. 16, 1976, 24976/76
Int. Cl.[2] A41C 1/14
U.S. Cl. 128—477 4 Claims

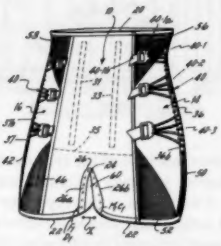


1. A brassiere construction comprising two breast-supporting portions and supporting strap portions, each breast-supporting portion having a rounded lower periphery and tapering toward the top, the strap portions including straps being attached to and extending around the peripheries of the breast-supporting portions, said latter portions being of unshaped, initially flat stretchable material attached to the said straps, and a band of less stretchable material attached to the said stretchable material of each breast-supporting portion along the rounded lower periphery thereof.

4,143,663
SACRO-LUMBAR GARMENT

Marguerite R. Williams, Trumbull, Conn., assignor to Surgical Appliance Industries, Inc., Cincinnati, Ohio

Filed Nov. 7, 1977, Ser. No. 849,232
Int. Cl.[2] A41C 1/00
U.S. Cl. 128—527 6 Claims



1. A convertible sacro-lumbar garment selectively usable with and without a removable crotch panel to provide panty and girdle styles, respectively, comprising:

front, rear, right and left side panels interconnected to form a generally tubular shaped garment for encircling the trunk of a wearer, said panels each being substantially inelastic and extending vertically upwardly to a point proximate the wearer's waist and extending vertically downwardly to a point below the wearer's crotch,

said front panel being slit in the central portion thereof from the lowermost edge thereof upwardly to a point above the wearer's crotch, said slit defining confronting vertical edges in said front panel,

a removable crotch panel having a front and a rear edge,

first fastener means on said confronting edges of said front panel to selectively maintain said slit in a closed condition to form a girdle style garment when said crotch panel is absent,

second fastener means secured to the interior of said rear panel, at a point sufficiently close to the lower edge thereof to avoid sitting on said second fastener means when said wearer is in a seated position,

front and rear fasteners on said front and rear edges of said removable crotch panel selectively cooperable with said first and second fastener means on said front and rear panels, respectively, for securing said crotch panel between said front and rear panels to convert said garment to a panty style,

a left elastic means formed in at least one of said left side, front or rear panels proximate the lower edge thereof to facilitate snug encirclement of said left thigh by said crotch panel and the lower edges of said left side, front and rear panels when said crotch panel is secured to said tubular shaped garment to form a panty style garment, and

a right elastic means formed in at least one of said right side, front or rear panels proximate the lower edge thereof to facilitate snug encirclement of said right thigh by said crotch panel and the lower edges of said right side, front and rear panels when said crotch panel is secured to said tubular shaped garment to form a panty style garment.

4,143,664

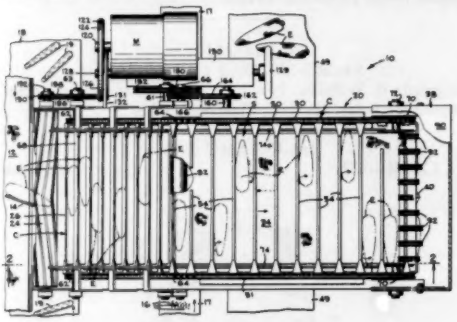
CORN CUTTER JAM CLEARING SYSTEM

Peter L. Chorney, Hoopeston, Ill., assignor to FMC Corporation, San Jose, Calif.

Continuation of Ser. No. 707,801, Jul. 22, 1976, abandoned. This application Oct. 20, 1977, Ser. No. 844,008

Int. Cl.[2] A01F *11/06*

U.S. Cl. 130—9 A **16 Claims**



1. In a corn cutter machine of the type having a rotary cutter head, cutting knives pivotally mounted on said head, feed rollers in front of said head, a conveyor for delivering uncut ears to said feed rollers, and means for driving said head, said feed rollers and said conveyor in a forward direction to deliver ears to the head and to rotate the head for cutting kernels from the ears; the improvement comprising control means for reversing the direction of said drive means, sensor means connected to said control means for sensing the presence of an ear passing through said cutter head, said control means including reverse time delay means for reversing said driving means to withdraw a jammed ear from said cutter head upon elapse of a predetermined time after said ear was first sensed by said sensor means while said driving means was driving in a forward direction, said reverse time delay means stopping the reversal of said driving means after the driving means has been reversed for a predetermined length of time that is normally sufficient to effect withdrawal of the jammed ear from said cutter head.

4,143,665

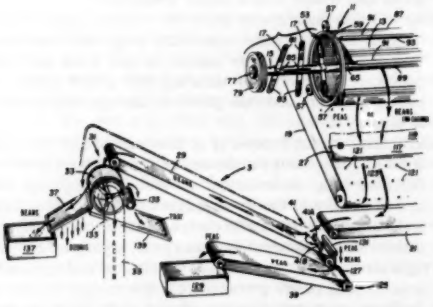
MACHINE FOR SHELLING BEANS OR PEAS AND FOR SEPARATING PARTICLES THEREFROM

Lee E. Griffin, Rte. 3, Box 252 BA, Littleton, N.C. 27850

Filed Jan. 21, 1977, Ser. No. 761,004

Int. Cl.[2] A01D *45/24*

U.S. Cl. 130—30 H **11 Claims**



1. A shelling apparatus for shelling beans, peas, or other legumes, comprising,

(a) a support frame,

(b) receiving chute supported by said support frame for receiving the legumes to be shelled,

(c) a shelling bin means supported by said support frame for shelling the legumes comprising a wire mesh basket having a cylindrically shaped wire mesh wall having a closed end and an open end, said open end adapted to receive the legumes to be shelled from said receiving chute, one wall segment of said cylindrically shaped wall comprises a bin door, having a length substantially equal to the length of said basket and hinged on one edge to the wall of said cylinder, said hinge line parallel to the major axis of said basket, means for supporting said basket such that the major axis of said basket is horizontal, motor means for rotating said basket about its major axis, beater shaft means comprising a longitudinal shaft positioned along the major axis of said basket, one end being rotatably connected to the closed end of said basket, the other end extending through the open end of said basket and through said receiving chute means, a plurality of beaters extending radially from said longitudinal shaft along the length thereof, shaft rotation means supported by said support frame and interconnected with said other end of said longitudinal shaft for rotating said shaft and beaters about the longitudinal axis of said shaft in the same direction as the rotation of said basket, and at a velocity greater than the rotation velocity of said basket, wherein rotational movement of said beaters removes the legumes from their shell whereby said legumes fall through the wire mesh basket, and said shells remain inside the wire mesh basket, pivot means operatively associated with said basket for pivoting said bin door in a closed position during a shelling operation, and in an open position during a trash removal operation,

(d) transverse conveyor means supported by said support frame comprising an inclined conveyor belt having an upper end and a lower end positioned below said shelling bin means having a width substantially equal to the length of said basket and comprising a plurality of knob means on said belt, and a transverse conveyor drive means for driving said transverse conveyor belt,

(e) product conveyor means supported by said support frame for conveying the shelled beans comprising a product conveyor belt positioned adjacent said lower end of the transverse inclined conveyor belt for movement in a direction substantially perpendicular to the movement of said transverse conveyor,

(f) debris conveyor means supported by said support frame comprising a debris removal conveyor belt positioned adjacent said upper end of said transverse inclined conveyor belt for movement in a direction substantially perpendicular to the movement of said transverse inclined conveyor belt.

4,143,666

SMOKING MATERIAL

Norman B. Rainer; Charles B. Hoelzel, and William C. Hopkins, all of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Division of Ser. No. 604,944, Aug. 15, 1975, Pat. No. 4,034,764. This application Feb. 15, 1977, Ser. No. 768,685

Int. Cl.[2] A24B *15/00*; A24D *1/00*

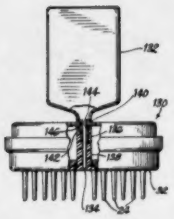
U.S. Cl. 131—2 **9 Claims**

1. An improved smoking material produced by contacting a film-forming carbohydrate material with ozone such that the molecular weight of the carbohydrate material is reduced.

4,143,667
RETRACTABLE DISPENSING BRUSHES

Lester R. Pellet, 6144 N. Talman Ave., Chicago, Ill. 60659

Division of Ser. No. 579,441, May 21, 1975, Pat. No. 4,001,910.
This application Dec. 6, 1976, Ser. No. 747,535
Int. Cl.[2] A46B *11/02*
U.S. Cl. 401—28 7 Claims



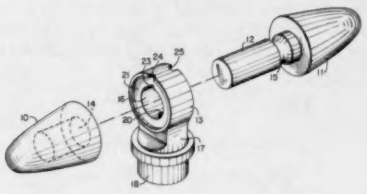
1. A retractable dispensing brush, comprising
a casing including front and rear members,
said front member having a front wall with a plurality of openings therein,
a bristle member movable within said casing and having a plurality of bristles thereon movable outwardly and retractable inwardly through said openings,
said rear member being rotatable about a predetermined axis relative to said front member,
means in said casing for causing said bristles to be extended and retracted in response to such relative rotation,
an axial member extending between said rear and front members,
said casing having an axial opening therein extending through said axial member and said front and rear members between the rear side of said rear member and the front side of said front wall,
a dispensing squeeze container mounted opposite the rear side of said rear member for holding a material to be dispensed,
and disengageable coupling means for mounting said dispensing container on said casing while connecting the interior of said dispensing squeeze container to said axial opening for dispensing the material through said axial opening to the front side of said front wall for use in conjunction with said bristles,
said dispensing squeeze container including collapsible wall means for imparting pressure to the material to be dispensed,
said disengageable coupling means comprising means for removably securing said dispensing squeeze container to said rear member of said casing,
and telescopically engageable elements on said rear member and said axial member for transferring the material from said dispensing squeeze container to said axial member.

4,143,668
ROLLER-TYPE COSMETIC APPLICATOR

Ernest H. Duval, Winthrop, and Harold R. Thompson, Duxbury, both of Mass., assignors to The Gillette Company, Boston, Mass.

Filed May 16, 1977, Ser. No. 797,001
Int. Cl.[2] A45D *40/30*
U.S. Cl. 132—88.5 6 Claims

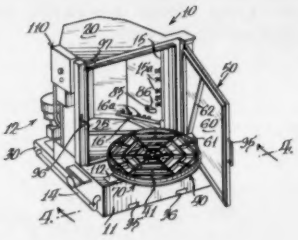
1. A roller-type cosmetic applicator comprising a pair of rollers fixed at opposite ends of an axle journaled within a generally hollow cylindrical bearing element, said axle defining a chamber between said axle and said bearing element, and structure connecting said bearing element to a product container and having an internal duct providing communication to said chamber from said product container, said bearing element having at least one opening removed from said connecting structure and in registration with said chamber, for dispensing said cosmetic for distribution by said rollers.



4,143,669
POWER PARTS WASHER

Gary E. Minkin, St. Louis, Mo., assignor to The Mart Corporation, Clayton, Mo.

Filed Jun. 10, 1977, Ser. No. 805,305
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—153 4 Claims



1. A power washer for automotive parts and the like having a cabinet with walls and with spray means therein, a circular turntable within the cabinet for support of parts to be washed and having a rim around the perimeter, means for rotatably mounting the turntable, and drive means for the turntable, said spray means including at least one horizontally-extending spray arm and at least one vertically-extending spray arm and each having a series of spray nozzles with the spray nozzles on the horizontally-extending spray arm grouped predominantly adjacent an outer part of the turntable to direct more fluid toward said outer part and the spray nozzles on the vertically-extending spray arm being more closely spaced adjacent the top of the turntable to direct more fluid toward the underside of parts supported on the turntable.

4,143,670
DUCTING FIRE PROTECTION

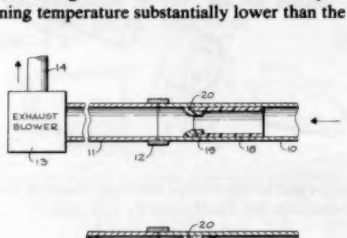
Rodney I. Olson, Los Angeles, and Nicholas J. Szegedi, La Canada, both of Calif., assignors to Fiber-Dyne, Inc., Sun Valley, Calif.

Filed Dec. 13, 1976, Ser. No. 749,686
Int. Cl.[2] F16K *17/38*
U.S. Cl. 137—72 3 Claims

1. A fire protection system for horizontally disposed ducting comprising:
a length of fiberglass duct of uniform diameter and having a continuous inner wall and having a flow path therethrough from an inlet to an outlet; and
a thermoplastic sleeve of uniform diameter and having a continuous wall and positioned entirely within said duct resting against said continuous inner wall of said duct as a liner coaxial with said duct in self-supporting relation, with the end of said sleeve closest to said outlet affixed to

said duct and with said sleeve maintaining its position in contact with said duct inner wall prior to heat softening without any sleeve internal support other than that which affixes said sleeve outlet end to said duct;

said sleeve being of a material characterized by having a softening temperature substantially lower than the softening temperature of said fiberglass duct whereby flow from said inlet to said outlet automatically effects permanent collapse of said sleeve onto itself into the flow path of said duct when said sleeve is heated to its softening temperature by flame or fluid flow in said duct, with said sleeve being of sufficient length to block flow through said duct upon collapse of said sleeve.

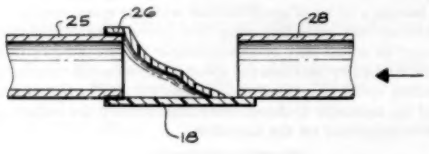


4,143,671

DUCTING FIRE PROTECTION

Rodney I. Olson, Los Angeles, Calif., assignor to Fiber-Dyne, Inc., Sun Valley, Calif.

Filed Nov. 11, 1976, Ser. No. 740,778
Int. Cl.[2] F16K *17/38*
U.S. Cl. 137—72 2 Claims



1. A fire protection system for ducting comprising:

a length of fiberglass duct having a flow path therethrough:

a thermoplastic sleeve disposed coaxial with said duct and affixed at one end to said duct; and

a second length of fiberglass duct disposed coaxial with said one duct and sleeve, with the other end of said sleeve positioned over the adjacent end of said second duct and free to move axially relative to said second duct, and with said second duct spaced from said first duct by said sleeve a distance greater than the diameter of said sleeve;

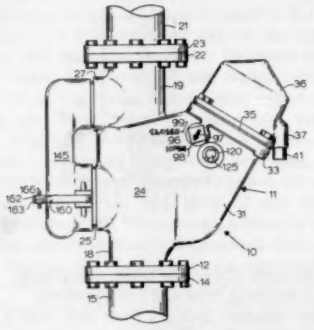
said sleeve being of a material characterized by having a softening temperature substantially lower than the softening temperature of said fiberglass ducts to effect collapsing of said sleeve into the flow path of said ducts when said sleeve is heated to its softening temperature by flame or fluid flow in said ducts.

4,143,672

ANTI-POLLUTION VALVE FOR USE WITH SHIPBOARD STORAGE TANKS

Harold H. West, Seattle, Wash., assignor to APV Corporation, Seattle, Wash.

Filed Jun. 21, 1977, Ser. No. 808,653
Int. Cl.[2] B63B *25/10*
U.S. Cl. 137—81 9 Claims



1. A valve unit for a shipboard storage tank for liquids, for installation in a vent conduit leading from an upper end of said tank to an outlet open to the atmosphere, said valve having a housing with an annular closure seat for said vent conduit and a closure member in said housing for automatically closing against said seat to close the conduit against the passage of fluids from said tank to said outlet, latching means in said housing for normally latching said closure member in open position so as normally not to interfere with venting and overflow functions, and unlatching means in said housing for unlatching said latching means upon said valve reaching a predetermined depth when the ship sinks, said valve unit having in combination therewith:

by-pass means around said closure seat, said by-pass means comprising

a by-pass conduit leading from below said closure seat to above said closure seat, and

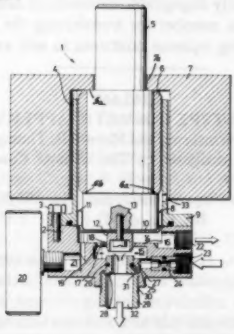
relief valve means in said by-pass conduit, opening only when the pressure below said closure seat is a predetermined amount higher than the pressure above said closure seat.

4,143,673

PRESSURE REGULATOR

Henrik M. Kitsnik, Segmon, Sweden, assignor to AB Kalle-Regulatorer, Sweden

Filed Jun. 14, 1976, Ser. No. 695,981
Claims priority, application Sweden, Jun. 17, 1975, 7506937
Int. Cl.[2] G05D *11/00*
U.S. Cl. 137—115 8 Claims



1. A pressure regulator comprising in combination:

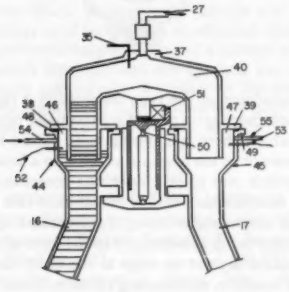
a body having an inlet port (23) of predetermined flow area and an outlet port (22) and an overflow port (32);
said body having inlet (15) and outlet (14) chambers communicating respectively with said inlet and outlet ports;
a valve seat (25) in said valve body communicating with said overflow port;
a wall (17) in said body spaced from said valve seat and separating said chambers;
said wall having perforate means (18) permitting continuous flow from said inlet chamber to said outlet chamber;
valve head means (12) operative through said wall and movable to coact with said valve seat to effect flow throttling for variable closing of flow to said overflow port;
a movable weight bias means (5, 7) effecting a movable wall (8, 10) of one (14) said chamber and operatively connected to said valve head means and being exposed to pressure in said one chamber so as to be operated by pressure therein to variably adjust said valve head means relative said valve seat responsive to pressure in said one chamber;
wherein pressure overcoming said weight bias means is effective to operate said valve head means for coaction with said valve seat to permit excess flow to communicate with said overflow port (32) for dropping pressure by throttling effect dependent upon said predetermined inlet port area and the variable flow area effected by coaction of said valve head means with said valve seat.

4,143,674

VALVE FOR CONTINUOUSLY AND AUTOMATICALLY SUPPLYING FURNACES WITH MOLTEN METAL

Robert Portalier, Ville D'Avray, France, assignor to Societe de Vente de l'Aluminium Pechiney, Paris, France

Filed Apr. 12, 1977, Ser. No. 786,882
Claims priority, application France, Apr. 28, 1976, 76 13456
Int. Cl.[2] F04F *10/00*; B22D *47/02, 35/00*
U.S. Cl. 137—151 **3 Claims**



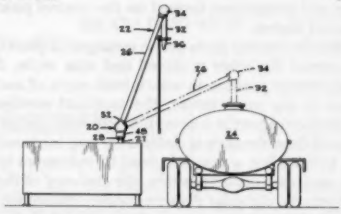
1. In a device for supplying molten metal to a furnace in a machine for casting metal under low pressure, said device having a first and a second siphon tube, the improvement comprising a valve for controlling the flow of said molten metal to said siphon tubes and a mating fitting at the inlet of each siphon tube, said fitting including a neck end of wider diameter than said siphon tube and an annular flange at the top edge of said neck end, said valve including an inverted U-shaped tube having a pair of depending legs, each in fluid communication with the other and of a diameter less than said neck end, an annular flange on each of said legs spaced upwardly from the free ends thereof, said flanges on said legs adapted to cooperate with the flanges on said neck ends of the siphon tubes with the free ends of said legs extending into said neck ends, gasket means interposed between said cooperating flanges, a pair of full face cover plates, rib means extending from said U-shaped tube to mount said cover plates coplaner with and disposed at 90° to said annular flange on the depending legs of the tube, means for lifting and lowering said tube, and means for rotating said U-shaped tube when raised, whereby said first and second siphon tubes are interconnected by said depending legs of the U-shaped tube during furnace supply and said siphon tubes being closed by said cover plates during casting.

4,143,675

TORSIONALLY CONTROLLED SWIVEL JOINT

Houston W. Knight, Whittier, Calif., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 745,133, Nov. 26, 1976, Pat. No. 4,111,465.
This application May 8, 1978, Ser. No. 904,079
Int. Cl.[2] F16L *27/00*
U.S. Cl. 137—615 **4 Claims**



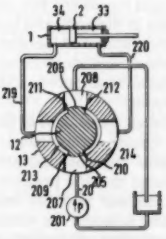
1. In a fluid handling flexible conduit system, the combination of a riser pipe communicating with a supply of fluid, a torsionally controlled swivel joint, means connecting said riser pipe in fluid tight engagement to a first section of said swivel joint for rotation about an upright axis, a second section of said swivel joint connected in fluid tight engagement with said first section for rotation about a generally horizontal axis, means defining a loading arm secured to the other section and movable from an upright to a generally horizontal position, a torque element disposed entirely within fluid flow passages in said system, an adjustment disc connected in fluid tight engagement to one of said sections for rotation relative thereto, first anchoring means on said disc for anchoring one end of said torque element, second anchoring means secured to the other swivel joint section for anchoring the other end of said torque element, and means for adjusting and locking said disc in one of a plurality of different positions of adjustment relative to said one section for selectively varying the torsional resistance of said torque element to rotation of one section relative to the other section through a predetermined arc in response to the weight of said loading arm means and the fluid therein.

4,143,676

HYDRAULIC PORT CONTROL APPARATUS, E.G. FOR MOTOR VEHICLE SERVO STEERING GEAR

József Ivony, XIII. Hegedüs Gyula U 50; Imre Lendvai, XIX, Árpád U. 35; László Szücs, I. Bathyány U. 14, and László Székely, I. Gyula u. 1, all of Budapest, Hungary

Continuation-in-part of Ser. No. 671,297, Mar. 29, 1976, abandoned. This application Dec. 29, 1977, Ser. No. 865,512
Int. Cl.[2] F16K *11/06*
U.S. Cl. 137—625.23 **12 Claims**



1. Hydraulic port control apparatus for approximating more

closely to pressure regulation proportional to displacement, for use with hydraulic devices of the reciprocating, double-acting type such as servo steering gear of motor-vehicles,

said control apparatus comprising a control mechanism including a control sleeve and a coaxial, cylindrical control piston, a control signal-generating element connected for movement transmission to one of said control sleeve and said control piston, while the other of said control sleeve and control piston being prevented from displacement in the direction of the control movement, pressure chambers, working fluid channels and working fluid inlets and outlets defined in the said apparatus and connected to the control mechanism as well as to the pressure chambers, and control ports defined between cooperating openings and projections formed on the control piston and the control sleeve,

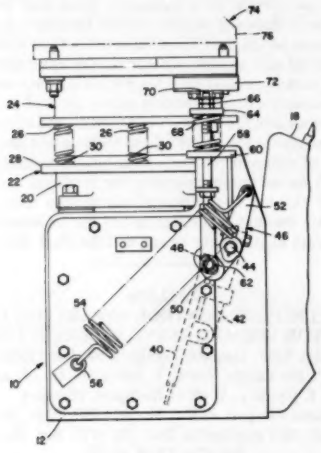
wherein the control ports are so arranged in pairs that as one is opened the other is closed and vice versa, there is an open center position in which both ports of each pair are open to the same extent, the sectional configuration of each control port in a direction perpendicular to the direction of flow through is defined by two intersecting circular arcs having a common cord of maximum length H in the said open center position, the diameter of the arcs if all the arcs are the same diameter or the smaller arc if the arcs are of different diameters is D, and $H \geq D/2$.

4,143,677

EXHAUST SYSTEM FOR VEHICLE

Ralph C. Schell, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 28, 1977, Ser. No. 791,905
Int. Cl.[2] F16K *11/02*
U.S. Cl. 137—875 **5 Claims**



1. A valve arrangement comprising:

a body having inlet means and first and second outlet means;

a valving element in the body and movable to a first position providing communication between the inlet means and first outlet means, and movable to a second position providing communication between the inlet means and second outlet means;

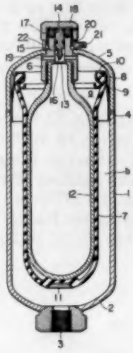
means for providing movement of the valving element comprising over-center spring means resiliently biasing the valving element into the first position with the valving element adjacent the first position, and resiliently biasing the valving element into the second position with the valving element adjacent the second position; wherein the means for providing movement of the valving element further comprise a plunger movably mounted relative to the body, and a lost-motion connection operatively connecting the plunger and valving element for providing that upon initial movement of the plunger in one direction from a first to a second position thereof with the valving element in its first position, the valving element remains in its first position with the plunger moved to an extent toward its second position, and for providing that upon initial movement of the plunger in another direction from its second toward its first position with the valving element in its second position, the valving element remains in its second position with the plunger moved to an extent toward its first position.

4,143,678

BLADDER TYPE ACCUMULATOR HOUSING A GAS BOMBE IN ITS GAS CHAMBER

Nobuyuki Sugimura, and Kazuo Sugimura, both of 308 Mabase, Shimizu, Shizuoka, Japan

Filed Oct. 31, 1977, Ser. No. 846,783
Claims priority, application Japan, Nov. 4, 1976, 51-13350
Int. Cl.[2] F16L *55/02, 55/04*
U.S. Cl. 138—30 **4 Claims**



1. An accumulator of the type comprising a rigid pressure vessel in which there are a pair of substantially opposite openings and in which there is a substantially elastic bladder that divides the interior of the pressure vessel into a liquid compartment with which one of said openings communicates and a pressure gas compartment that is sealed from said liquid compartment, said accumulator being characterized by:

A. the bladder being substantially in the form of an open bag that is sealed around its edge to the inner surface of the pressure vessel, in surrounding relation to said other opening, the bladder being so disposed that in its relaxed condition it extends away from said other opening;

B. a rigid gas cartridge in which there is a supply of gas under pressure, said cartridge having a wall portion that is normally closed but can be opened to permit the escape of gas from the cartridge;

C. connection means received in said other opening in the pressure vessel and cooperating with the pressure vessel and with the cartridge to support the cartridge within the bladder with said wall portion of the cartridge adjacent to said other opening and substantially aligned with an axis of said other opening that extends to the interior and to the exterior of the pressure vessel, said connection means providing a passage through which gas from the interior of the cartridge, flowing out of the cartridge upon opening of said wall portion, can enter the gas compartment inside the bladder; and

D. a cartridge opening device mounted in said other opening in the pressure vessel, said cartridge opening device being movable in a direction parallel to said axis and having

(1) an outer actuating portion accessible at the exterior of

the pressure vessel by which motion in said direction can be imparted to the cartridge opening device,

(2) an inner portion adjacent to said wall portion of the cartridge and which normally permits said wall portion of the cartridge to remain closed but effects opening of said wall portion in consequence of motion in said direction, and

(3) means cooperable with relatively fixed means on the pressure vessel to provide a seal at said other opening in the pressure vessel whereby gas from the cartridge is confined to the pressure gas compartment.

4,143,679

FABRIC HAVING A REINFORCED WARP STRIP AND A PROCESS FOR PRODUCING THE SAME

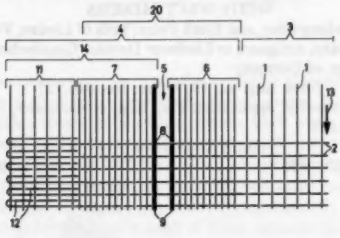
Paul Lüber, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Continuation of Ser. No. 709,711, Jul. 29, 1976, abandoned. This application Jan. 19, 1978, Ser. No. 870,628

Claims priority, application Switzerland, Aug. 7, 1975, 010297/75

Int. Cl.² D03D *23/00*

U.S. Cl. 139—383 R **9 Claims**



1. A woven fabric having warp threads and weft theads forming a background section and an adjacent reinforced warp strip, said reinforced warp strip having a selvage and an adjoining strip section between said selvage and said background section wherein said selvage is weaker in the warp direction than said strip section and said weft threads have looped ends of a length equal to the width of said selvage.

4,143,680

CONCEALED SLIDE FASTENER

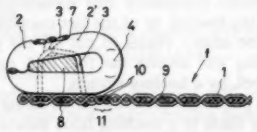
Ryukichi Murai, Toyama, and Noritaka Tubata, Uozu, both of Japan, assignors to Yoshida Kogyo K.K., Japan

Filed May 17, 1978, Ser. No. 906,916

Claims priority, application Japan, May 18, 1977, 52-63377[U]

Int. Cl.² A44B *19/32, 19/42*

U.S. Cl. 139—384 B **1 Claim**



1. A concealed slide fastener comprising an engageable pair of fastener stringers individually consisting of a woven fabric tape and an element attached along a side edge portion of said tape, characterized in that said woven fabric tape has a thinner portion about which the warp yarn woven therein in a few runs is finer than the warp yarns woven in the rest portion thereof, said thinner portion being formed transversely at a portion of the tape which substantially corresponds to the center of the coupling heads of the element and at which the tape is folded, and longitudinally through the entire length of the tape.

4,143,681

APPARATUS FOR DISTRIBUTING PRESSURIZED FLUID TO A MULTI-ELEMENT WEFT INSERTER

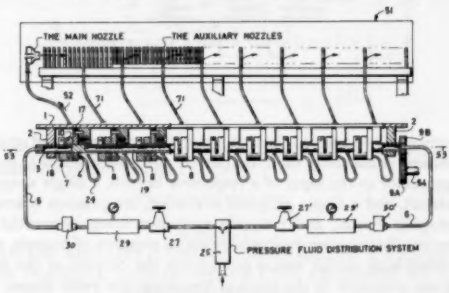
Vladimír Kuda, Blazovice, and Miroslav Buček, Brnenske Ivanovice, both of Czechoslovakia, assignors to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstyl, Brno, Czechoslovakia

Filed Oct. 1, 1976, Ser. No. 728,771

Claims priority, application Czechoslovakia, Oct. 1, 1975, 6620-75

Int. Cl.² D03D *47/30*

U.S. Cl. 139—435 **6 Claims**



1. In a fluid-jet weaving machine, an apparatus for distributing pressurized fluid to a multi-element weft insertion section associated with the machine, the apparatus comprising, in combination, an elongated frame, a distributing cylinder supported for rotation in the frame, the cylinder having a longitudinal axis and first and second opposed ends, the cylinder further having a plurality of first peripheral openings therein extending in axially spaced relation between the first and second ends, a plurality of valve means individually associated with the periphery of the cylinder for selectively coupling fluid from the interior of the cylinder to an associated one of the elements in the weft insertion apparatus via the peripheral openings in the cylinder, each valve means having a first apertured portion supported by the cylinder and having a first fluid conduit therein communicating at its inlet end with the associated one of the first peripheral openings on the cylinder, each valve means further having a second apertured portion supported by the frame adjacent an associated one of the first portions, said second portion having a second fluid conduit whose inlet end cyclically communicates with the outlet end of the first conduit in the first portion during a rotation of the cylinder in the frame, first means for introducing pressurized fluid into the first end of the cylinder, and means for rotating the cylinder about its longitudinal axis within the frame.

4,143,682

MECHANISM FOR CONTROLLING THE PRESSURE FLUID SUPPLY TO THE WEFT INSERTING NOZZLES OF A MULTI-COLOR JET LOOM

Miloš Jansa; Juraj Spišiak, and Stanislav Ferdus, all of Brno, Czechoslovakia, assignors to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi, Brno, Czechoslovakia

Filed Jan. 3, 1978, Ser. No. 866,710

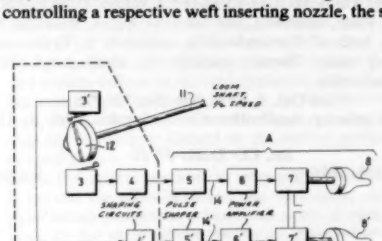
Claims priority, application Czechoslovakia, Dec. 31, 1976, 8877/76

Int. Cl.² D03D *47/30*

U.S. Cl. 139—435 **3 Claims**

1. Mechanism for controlling the pressure fluid supply to a plurality of weft inserting nozzles of a jet loom provided with a mixing device for changing the wefts, comprising a synchro-

nizing pulse circuit incorporating a single position scanner driven in synchronism with the loom, and circuit means having a plurality of identical parallel branches each having an input, each of said branches comprising a serially connected combination in the order named of a pulse shaper, a power amplifier, and a solenoid-controlled valve, a plurality of weft inserting nozzles, each solenoid-controlled valve being connected to and controlling a respective weft inserting nozzle, the synchronizing pulse generator having a plurality of outputs, and circuit means connecting each output of the synchronizing pulse generator to the input of a respective branch, a single shaping circuit, and a single program evaluator, the position scanner, shaping circuit, and program evaluator being connected in series, the program evaluator having a plurality of outputs, and comprising circuit means connecting the outputs of the program evaluator to the input of the respective pulse shaper.



4,143,683

DEVICE FOR CONTROLLING AND CUTTING THE WEFT THREADS IN LOOMS WITH WEFT INSERTERS

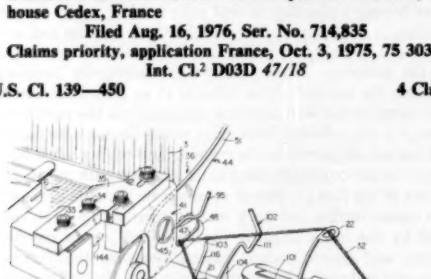
Georges Scheidecker, Mulhouse, France, assignor to Societe Alsacienne de Constructions Mechaniques de Mulhouse, Mulhouse Cedex, France

Filed Aug. 16, 1976, Ser. No. 714,835

Claims priority, application France, Oct. 3, 1975, 75 30301

Int. Cl.[2] D03D *47/18*

U.S. Cl. 139—450 **4 Claims**



1. In a loom for weaving cloth and including a loom framework, a sley, and entry and exit weft-insertion needles each provided with nippers, the combination of means for controlling and means for cutting weft threads, comprising:

(A) a thread cutter including a component carried by the loom framework in position to be immediately proximate a selvedge of a cloth being woven, a stationary counterblade secured to said component, a movable knife, and a blade secured to said movable knife;

(B) a threading mechanism adapted to receive weft thread to be inserted and being formed by a longitudinal ramp ending at the rear thereof in an upwardly and forwardly opening loop located just above the path of the entry needle;

(C) means rigidly securing said threading mechanism on the sley;

(D) a vertically movable lowering hook carried by the sley;

(E) and means operable to move said lowering hook to a selected one of first and second positions in the first of which it is above the weft thread portion connecting said threading mechanism loop to the cloth when the sley reaches its front neutral position and in the second of which it presses a portion of the weft thread down on to the path of the entry needle nippers when the sley has already moved back a small amount;

(F) said second position of said lowering hook being located below the path of said entry needle nippers so that the portion of weft thread presented to said nippers is that located between said threading mechanism and said lowering hook.

4,143,684

PROCESS AND APPARATUS FOR REED-BEATING AND CUTTING OFF FILLINGS INSERTED INTO THE SHED IN SHUTTLELESS WEAVING MACHINERY EQUIPPED WITH WEFT MIXERS

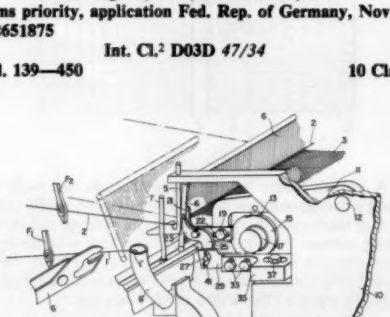
Walter Lindenmüller, and Erich Peter, both of Lindau, Fed. Rep. of Germany, assignors to Lindauer Dornier Gesellschaft mbH, Fed. Rep. of Germany

Filed Aug. 22, 1977, Ser. No. 826,737

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1976, 2651875

Int. Cl.[2] D03D *47/34*

U.S. Cl. 139—450 **10 Claims**



1. In the process for beating up and cutting off fillings inserted into the shed in shuttleless weaving equipment provided with a reed, scissors, and weft mixers, in particular in weaving machinery with filling insertion by means of grippers advancing into and retracting from the shed, the inserted filling being cut off on the insertion side outside the selvage,

the improvement comprising that simultaneously with or following the beating up of the last inserted filling:

(a) closing the scissor blades to cut off the previously inserted filling and seizing the free end, connected to a supply spool, by a holding system,

(b) guiding a portion of the last inserted filling over the back of a scissor blade to a catching hook mounted outside the scissors, the back of said scissor blade facing the reed,

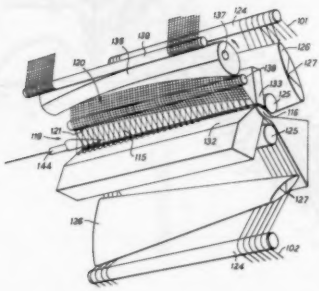
(c) simultaneously with the back-motion of the reed, displacing the scissors transversely to the direction of the filling in an orthogonal plane and reopening them, the last inserted filling passing from the back of the scissor blade to the front of the other scissor blade and into the cutting position determined by the catching hook, and

(d) moving back the scissors into its initial position with the last inserted filling between the opened scissor blades.

4,143,685
WEAVING LOOMS

Stephen Temple, and Anthony D. Paton, both of Cambridge, England, assignors to Cambridge Consultants Limited, Cambridge, England

Filed Aug. 24, 1977, Ser. No. 827,173
Claims priority, application United Kingdom, Sep. 1, 1976, 36212/76
Int. Cl.² D03C *13/00*; D03D *47/26*
U.S. Cl. 139—456 **24 Claims**



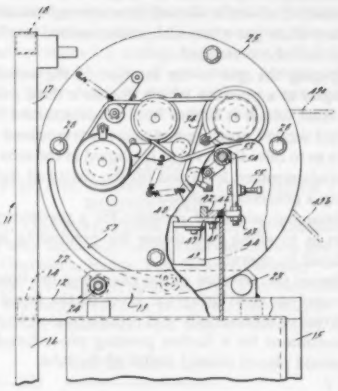
1. A loom comprising means for feeding a plurality of warp yarns to a shedding region and take-up means for drawing woven fabric from the shedding region, each warp yarn passing through a retraction region and the shedding region, means for creating gaseous fluid flow along one or more portions of each of the warp yarns so that unrestrained yarns along which the fluid flow is created are moved longitudinally in a first direction to form a loop in each of those yarns in the shedding region, and means for mechanically displacing portions of warp yarns in the retraction region thereby to move the yarns longitudinally in a second direction into a path of predetermined length to draw the yarns into tension in the shedding region, means for separating the loops of yarn from the warp yarn sheet in the shedding region to form a shed for the insertion of a weft yarn, weft insertion means for inserting a weft yarn into the shed, and bearing means for beating the inserted weft yarn against the fell of the woven fabric.

4,143,686
COIL BINDING MACHINE

Albert E. Sickinger, Bloomfield Hills, and Thomas G. Lhota, Lake Orion, both of Mich., assignors to Hans Sickinger Co., Pontiac, Mich.

Filed Feb. 13, 1978, Ser. No. 877,233
Int. Cl.² B21F *15/00*
U.S. Cl. 140—92.93 **6 Claims**

1. A coil binding machine comprising a fixed rear clamp, a movable front clamp, said clamps having facing surfaces for gripping a sheet group therebetween, a coiling tool adjacent one end of said clamps, means for driving said coiling tool, means for moving said front clamp between unclamping and clamping positions, a pair of arcuate plates on opposite sides of said machine, said clamps, coiling tool, driving means and moving means being mounted between said plates, means supporting said plates for rocking movement, a fixed frame carrying said plate supporting means, means securing said plates together for movement in unison, said clamps being spaced from the central axis of said plates whereby rocking of said plates will change the height of said clamps and the angle

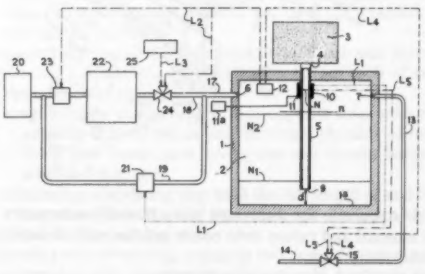


of their facing surfaces, and means securing said plates in their arcuately adjusted position.

4,143,687
PROCESS AND DEVICE FOR CONTROLLING A VESSEL FOR POURING LIQUID UNDER LOW PRESSURE IN A REPEATED MANNER

Rio Belloci, Pont-a-Mousson, France, assignor to Pont-a-Mousson S.A., Nancy, France

Filed Oct. 14, 1977, Ser. No. 842,195
Claims priority, application France, Oct. 18, 1976, 7631267
Int. Cl.² B65B *3/04*
U.S. Cl. 141—1 **11 Claims**



1. In a process for controlling a liquid in a liquid-containing vessel having a pouring tube having an end portion defining an outlet and an opposite end portion immersed in the liquid, for a repeated pouring of the liquid under a low pressure into sand moulds, each of which moulds comprises at least one mould cavity and a liquid inlet passageway, combined with means for precluding a return flow of the liquid from the mould cavity after the liquid has filled said cavity, said liquid being controlled by means of a driving gas under pressure supplied to the interior of the vessel above the liquid in the vessel; the improvement comprising in combination the steps of:

placing the mould on said outlet of the tube to enable the supply of the liquid to the cavity by way of said passageway;

supplying said gas under a first pressure to the interior of the vessel above the liquid to raise the liquid in the tube;

detecting the arrival of the liquid at a predetermined level in the tube;

stopping the flow of the gas under said first pressure when said predetermined level is reached;

measuring the pressure of the gas above the liquid in the vessel to detect a second pressure representing the pressure of the gas when said predetermined level of the liquid in the tube is reached;

supplying the gas to the interior of the vessel above the liquid at a pressure which creates a third pressure in the vessel which is higher by a predetermined amount than said second pressure and at a predetermined rate of flow so as to raise the level of the liquid in the tube beyond said predetermined level and fill the cavity of the mould during a predetermined time;

maintaining said third pressure for a predetermined period so as to allow said means for precluding return of the liquid to operate;

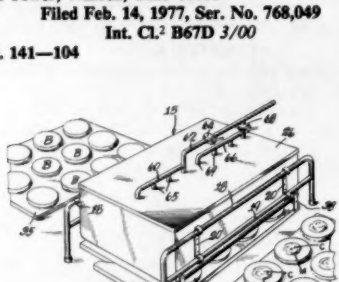
reducing the pressure of the gas above the liquid inside the vessel so as to bring the level of the liquid in the tube down to substantially said predetermined level and create conditions for a further pouring procedure for a second mould placed on said outlet of the tube.

4,143,688

APPARATUS FOR SELECTIVELY DISPENSING PASTY SUBSTANCES

Robert E. Gill, Jr., 23855 David Dr., Suite 202C, North Olmstead, Ohio 44070, and Michael Williams, 704 Second National Tower, Warren, Ohio 44481

Filed Feb. 14, 1977, Ser. No. 768,049
Int. Cl.[2] B67D *3/00*
U.S. Cl. 141—104 **2 Claims**



1. Apparatus for dispensing pasty flowable substances such as mustard and catsup onto edible articles such as hamburger buns, comprising:

a tray for a plurality of said articles,

a container having two separate adjoining compartments, one containing a flowable pasty substance such as mustard, and the other containing a different flowable pasty substance such as catsup, each compartment having an opening in a bottom wall thereof with said openings in juxtaposition, said container being disposed in position with said bottom walls above and spaced from said tray and the tray being movable relative to said container to align a said article with both said openings in said two compartments,

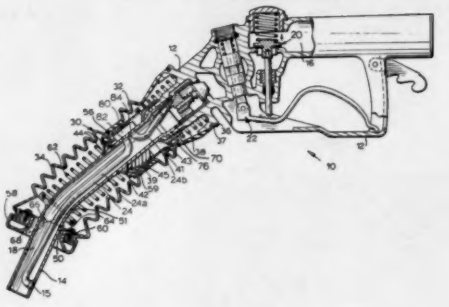
and valve means controlling flow of said substances through said juxtaposed openings, said valve means being constructed and arranged to control said compartment openings to selectively provide for dispensing of one or the other of said substances or both at the same time and counter top support means attached to said container for supporting the container above a counter top, said counter top support means comprising spaced support feet for allowing said tray to pass therethrough.

4,143,689

FLOW CONTROL FOR VAPOR RECOVERY NOZZLE

David H. Conley, and James D. Whitmore, both of Conneaut, Ohio, assignors to Emco Wheaton Inc., Conneaut, Ohio

Filed Feb. 22, 1977, Ser. No. 770,818
Int. Cl.[2] B65B *3/18, 57/14*
U.S. Cl. 141—207 **11 Claims**



1. In a vapour recovery liquid dispensing nozzle of the type having a main body portion and a liquid discharge tube and means releasably securing said liquid discharge tube to said main body, said liquid discharge tube projecting outwardly from said main body portion, the wall of said discharge tube having an exterior surface extending longitudinally thereof, a vacuum operated release mechanism in said main body for automatically closing the flow control valve when the level of liquid in the tank being filled thereby rises to a level closing the end of the primary vent passage of the vent tube, the vent tube extending through the liquid discharge passage which is formed in the liquid discharge tube of the nozzle, and an extensible vapour recovery shroud assembly extending around the liquid discharge tube for directing vapour to the recovery passage in the body of the nozzle, the shroud assembly being movable from an extended position to a retracted position by engagement with a filling tube when the liquid discharge tube is operatively located within a filling tube of a liquid storage tank with the vapour recovery passage thereof communicating with the tank by way of the shroud assembly, and extendable from the retracted position to the extended position by an extension spring assembly, the improvement wherein;

(a) said primary vent passage has a section which extends outwardly from said discharge passage through an opening in the wall of the liquid discharge tube and returns to the discharge passage through an opening in the wall of the liquid discharge tube, said openings being spaced outwardly from said main body, and

(b) a normally closed vent valve in said section of said primary vent passage, said vent valve being mounted on and carried by said exterior surface of said liquid discharge tube and spaced a substantial distance from said main body, said vent valve having a vent valve member movable between a closed position closing said primary vent passage and an open position in which said primary vent passage is open,

(c) said shroud assembly being adapted to engage said vent valve member to move said vent valve member between said first and second positions in response to movement of said shroud assembly between said extended position and said retracted position whereby said primary vent passage is closed to prevent the flow of liquid through said liquid discharge tube when said shroud assembly is extended and is open to permit the flow of liquid through said liquid discharge tube when said shroud assembly is retracted.

4,143,690

SPILL FREE FLUID TRANSFER FUNNEL

Boleslaw L. Dunicz, 8 Locksley Ave., 1H, San Francisco, Calif. 94122

Continuation-in-part of Ser. No. 576,017, May 9, 1975, abandoned. This application Jun. 22, 1977, Ser. No. 808,983

Int. Cl.[2] B67C *11/02*

U.S. Cl. 141—333 2 Claims

1. A funnel device for spill-free, and fume escape inhibiting transfer of fluid into a fluid receiving vessel from a container equipped with a tubular orifice, said device being formed with an upper domed portion and a lower eduction nose, said nose tapering downwardly to a narrow terminus for protruding into said fluid receiving vessel, said eduction nose being continuous at its upper end with the lower end of said domed portion, said domed portion having a side opening in a side wall thereof for admitting the tubular orifice of said container, said domed portion combined with said eduction nose providing a chamber which is completely closed except for said side opening and said terminus, said side opening serving to permit the insertion and removal of a tubular orifice of a container from which fluid is being transferred and being of a size to permit easy insertion and removal of such orifice but small enough to inhibit escape of liquid and vapor during such transfer except through the eduction nose.

4,143,691

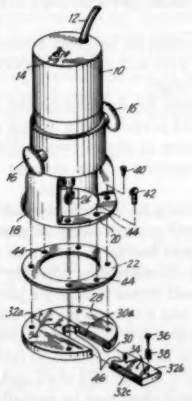
ROUTER

Clayton Robinson, Willow Grove Rd., Stony Point, N.Y. 10980

Filed Mar. 13, 1978, Ser. No. 886,308

Int. Cl.[2] B27C *5/10*

U.S. Cl. 144—134 D 6 Claims



1. A substantially cylindrical router tool construction for use in cutting a workpiece and having an axially disposed cutting tool, comprising a motor, a motor housing, a base frame depending from said motor housing and terminating at its lower end in an annular base, to which is fixedly attached an annularly shaped router base plate, defining a center slot, and including a pair of slides for mating engagement with said slot, each slide defining a plurality of positioning openings for receiving a pilot pin to hold the router tool to a center point in the workpiece to cut an arc therein with said cutting tool.

4,143,692

METHOD FOR THE PRODUCTION OF TIMBER FROM ROUND LOGS

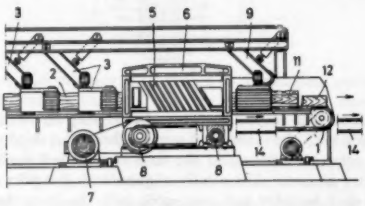
Josef Traben, Oberkirch, Baden, Fed. Rep. of Germany, assignor to Firma Gerbruder Linck Maschinenfabrik und Eisengiesserei, Oberkirch, Baden, Fed. Rep. of Germany

Division of Ser. No. 607,298, Aug. 25, 1975, Pat. No. 4,086,944. This application Jan. 19, 1977, Ser. No. 760,660

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1975, 2514901

Int. Cl.[2] B27L *9/00*

U.S. Cl. 144—323 1 Claim



1. A method of removing outer portions of a cylindrical log to form a timber of desired cross-sectional shape from the central portion of the log, said method including the steps of:

advancing said log longitudinally between two opposed banks of staggered knives that are disposed progressively closer to the longitudinal axis of the log in the direction of advance of said log;

engaging said log on opposite sides thereof with said knives;

removing a respective cylinder segment from each of said opposite sides by

longitudinally slicing each of said opposite sides with the adjacent bank of knives and forming a plurality of relatively thin sheets each having one end thereof integral with said log; and

continuing said slicing step until the full length of said log has passed between said banks and said sheets are separated from said log; and

repeating said advancing, engaging and removing steps with successive sets of opposite sides of said log until said timber of said desired cross-sectional shape is formed.

4,143,693

HAND TOOL WITH POSITIVE-DRIVER BUT FREELY-REVERSIBLE HANDLE

Ignacio Acevedo, 4066 Fenwick Ct., Columbus, Ohio 43220

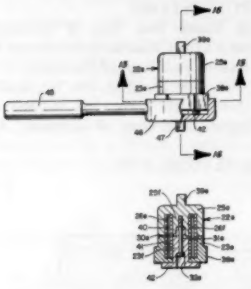
Filed Dec. 20, 1977, Ser. No. 862,573

Int. Cl.[2] B25B *15/00*

U.S. Cl. 145—76 5 Claims

1. A hand tool having a handle for selectively applying torque driving force to a tool element or freely reverse turning relative to the tool element comprising a driving connection between the handle and the tool element, said connection comprising axially-aligned relatively rotatable shaft members non-rotatably connected respectively to the handle and the tool element and having annular contact surfaces, and a coil spring extending axially of the shaft members and disposed helically about the axes thereof in frictional engagement with said contact surfaces so that when the handle is rotated in one

direction, the driving shaft member connected thereto, twists the spring in the proper direction to apply driving torque to the driven shaft member connected to the tool element but when the handle is rotated in a reverse direction the spring is twisted to release the driving torque to permit free rotation of the handle relative to the tool element, said shaft members comprising a first shaft member having means for connecting it non-rotatably to the handle and a second shaft member having means for connecting it non-rotatably to a tool element, said shaft members having axially-aligned inter-fitting inner central shaft portions, said coil spring helically wound around such



portions, said second shaft member having an outer skirt concentric with the inner shaft portion thereof, a third shaft member rotatable relative to the first and second shaft members having an outer skirt axially aligned with the skirt of the second shaft member and concentric with the inner shaft portion of the first shaft member, a second coil spring disposed helically within the aligned skirts and frictionally engaging therewith but spaced from the first spring, said springs being wound in the same direction, and said handle including means for selectively rotating either said first shaft member or said third shaft member.

4,143,694

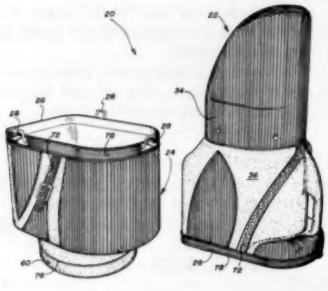
GOLF BAG CONTAINER

Frederick S. Gregory, 3721 Northaven Rd., Dallas, Tex. 75229

Filed Jul. 1, 1977, Ser. No. 812,257

Int. Cl.[2] A63B *55/00*

U.S. Cl. 150—1.5 R **10 Claims**



1. A substantially rigid, golf bag container comprising:

an upper body including an intermediate section having integral handle means formed thereon, a substantially flat base opposite the integral handle means for supporting the container thereon, and a truncated cylindrical head section extending from and integral with the intermediate section,

a lower body including a substantially flat base and a curvilinear surface opposite the flat base,

a cylindrical golf bag receiving end extending from an integral with said lower body, and

means for releasably securing the lower body opposite said cylindrical receiving end to the upper body opposite said head section such that the base of said lower body is aligned in substantially the same plane as the base of said upper body.

4,143,695

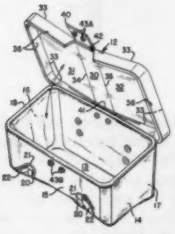
PICNIC CHEST

Dalton Hoehn, Zimmerman, Minn., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Jul. 3, 1978, Ser. No. 921,611

Int. Cl.[2] A45C *11/20*

U.S. Cl. 150—52 R **10 Claims**



1. A chest for use in picnicking, comprising:

upwardly opening container structure suitable for holding food, said container structure being formed by bottom wall means bounded by side wall means, said side wall means having upper edge means which define the upper open end of said container structure;

lid means for closing said container structure, said lid means being dimensioned to fit over the upper open end of said container structure to substantially close same, said lid means being made of a central lid portion interposed between first and second lid end portions, said central lid portion having diametrically opposed first and second ends with first and second substantially parallel longitudinal edges extending therebetween;

first hinge means for hingedly connecting said first lid end portion with said central lid portion along its first longitudinal edge;

second hinge means for hingedly connecting said second lid end portion with said central lid portion along its second longitudinal edge;

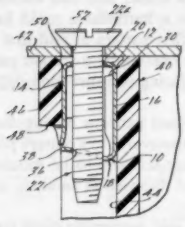
third hinge means for detachably and hingedly connecting said central lid portion along its first end to said container side wall means at one of two selected substantially diametrically opposite points on said container side wall means; and

fourth hinge means for detachably and hingedly connecting said central lid portion along its second end to said container side wall means at the other of said two selected substantially diametrically opposite points on said container side wall means whereby a picnic chest is provided from which said lid means may be selectively removed by detaching said third and fourth hinge means, on which said lid means may be pivoted to fully open said chest by detaching only one of said third and fourth hinge means, or in which said chest may be partially opened on opposite ends by pivotally opening said first and second lid end portions.

4,143,696
SELF-LOCKING, SELF-RETAINING FASTENER

Robert J. Holton, North Caldwell, and James F. Waterson, Cranford, both of N.J., assignors to Eaton Corp., Cleveland, Ohio

Filed Aug. 8, 1977, Ser. No. 822,487
Int. Cl.[2] H02G 3/14; F16B 37/02
U.S. Cl. 151—41.75 2 Claims



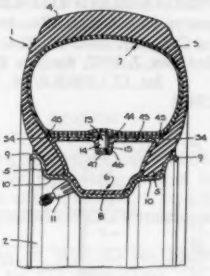
1. A self-locking, self-retaining fastener adapted for frontal insertion into a bore in a base for receiving and retaining a longitudinally non-rotationally inserted screw which resists non-rotational removal of the screw after insertion and lockingly engages the inserted screw upon rotation of the screw, said fastener having a resilient one piece body including a fastener receiving portion having a fastener receiving aperture therethrough, a longitudinal retaining portion attached to one side of said fastener receiving portion and extending parallel to the longitudinal axis of said fastener, a guiding portion attached to said fastener receiving portion opposite said longitudinal retaining portion and extending parallel to the longitudinal axis of said fastener, said longitudinal retaining portion, fastener receiving portion and guiding portion defining a generally U-shaped cross-section on a plane passing through said retaining portion, guiding portion and longitudinal axis, and a cantilevered bottom fastener retaining portion attached to the end of said guiding portion opposite said fastener receiving portion, said bottom fastener retaining portion lying in a plane which intersects the longitudinal axis at an acute angle and having therein a fastener engaging aperture substantially aligned with said longitudinal axis, said fastener engaging aperture having opposed edges which will engage and retain the major diameter of the threads of said screw, said longitudinal retaining portion having at least one projection near the free end thereof, said projection extending away from the longitudinal axis of said fastener and being adapted to engage a portion of said base when said fastener is inserted into said base, rotational tightening of a received screw effective to cause the free end of said bottom fastener retaining portion to engage the free end of said longitudinal retaining portion to resist movement of said projection towards said longitudinal axis thereby locking said fastener in said base and preventing further movement of the bottom fastener retaining portion relative to said longitudinal retaining portion thereby allowing a significant friction engagement to be developed between the received fastener and the fastener engaging aperture.

4,143,697
INNER TUBE ASSEMBLY FOR RUN-FLAT TIRES

Gilbert L. Igea, Clairoix; Henri J. Mirtain, Compiegne, both of France, assignor to Uniroyal, Clairoix, France

Filed Feb. 10, 1977, Ser. No. 767,248
Int. Cl.[2] B60C 17/02, 17/00
U.S. Cl. 152—340 5 Claims

1. An inner tube assembly for a pneumatic tire, said assembly comprising an annular, flexible, extensible primary tube means adapted to lie at least partially radially coextensively with and axially between the beads of the tire when the assembly is mounted in the tire, primary valve means connected to and communicating with the interior of said primary tube means, secondary tube means surrounding said primary tube means, secondary valve means interconnecting and communicating with the interiors of said primary and secondary tube means, and an apertured, substantially inextensible, flexible annular band interposed between said primary and secondary tube means, said band being coextensive axially with said primary tube means and said secondary tube means at a parting line therebetween, said band having an axial extent at least equal to the span of the internal space of the tire in its inflated operating condition at the location occupied by said band in said operating condition, whereby said band will limit the circumferential



expansion of said primary tube means to a specified amount upon the inflation of the latter via said primary valve means, said secondary valve means remaining open and intercommunicating through said apertured band the interiors of said primary and secondary tube means for as long as there remains an equilibrium of pressure therebetween, said secondary valve means including closure means for pneumatically isolating the interiors of said primary and secondary tube means from one another when the equilibrium of pressure between said primary and secondary tube means is lost.

4,143,698
PORTABLE WALL PARTITION

Kurt Smolka, Nimrodstrasse 20, D-1000 Berlin 28, Fed. Rep. of Germany

Filed Apr. 10, 1978, Ser. No. 894,800
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1977, 2716736
Int. Cl.[2] E06B 9/08
U.S. Cl. 160—120 7 Claims

1. A portable and foldable wall partition, comprising:

a plurality of upstanding spaced-apart vertical supports, each of which has at least one roller coupled to the lower end thereof to permit rolling of the supports along a floor;

a plurality of sheaths each of which encompass the lower end portion of one of said vertical supports and which is axially adjustable relative to the vertical support on which it is mounted, said sheath including a generally, bell-shaped jacket which encloses said roller and which is engageable with the floor;

a plurality of horizontally-extending lateral supports, each of which extends between a pair of adjacent vertical supports, said lateral supports being supported at their ends on said vertical supports for limited pivotable movement about a vertical axis so as to maintain a minimum angle which is greater than zero between two adjacent lateral supports and to ensure the stability of the wall partition, said lateral supports being rotatable about their longitudinal axes and being arrestable in a fixed position;

a filler material which is at least partially woundable on said lateral supports, the lower end of which serves as a seal for sealing engagement with the floor;

a plurality of top sealing members, each of which is coupled to one of said lateral supports for sealing the wall partition against a ceiling; and

a plurality of flexible joint covering bars for sealing the spaced between the two outermost vertical supports and adjacent room walls.

4,143,699

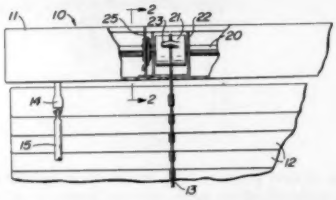
VENETIAN BLIND TILT LIMITER

Anthony F. Marotto, Philadelphia, Pa., assignor to Marathon Manufacturing Company, Houston, Tex.

Filed Nov. 7, 1977, Ser. No. 849,094

Int. Cl.[2] E06B 9/26

U.S. Cl. 160—176 R **6 Claims**



1. A venetian blind tilt operating mechanism comprising a head rail, a tilt rod journaled in said head rail and rotatable for tilting slats, operating means for rotating said tilt rod in opposite directions, a mounting member non-rotatably positioned in said head rail adjacent to said tilt rod, said mounting member having a guideway partially surrounding said rod, a radial extension on said rod extending into said guideway and rotatable with said rod for swinging in said guideway, and stop members positioned in said guideway for limiting engagement with said rod extension to limit tilting movement of slats, said mounting means comprising a plate extending conformably across said head and, said radial extension including a hub on one side of said plate, an offset portion extending from said hub through said guideway, and a terminal portion extending from said offset portion on the other side of said plate.

4,143,700

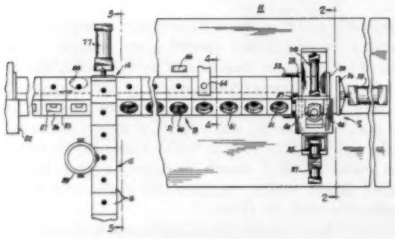
ANGLED MOLDING MACHINE

Leszek R. Drobnik, Euclid, Ohio, assignor to Acme-Cleveland Corporation, Cleveland, Ohio

Filed Aug. 18, 1977, Ser. No. 825,644

Int. Cl.[2] B22C 13/00, 15/08, 17/00

U.S. Cl. 164—187 **13 Claims**



1. A molding machine comprising, in combination,

first and second pattern plates adapted to carry first and second patterns, respectively,

enclosure means including molding chamber means and said first and second pattern plates capable of forming an enclosed investment volume,

power means connected for relatively moving said first pattern plate and said molding chamber means from a first position to a closed investment position along a first path,

said power means being connected for relatively moving said second pattern plate and said molding chamber means from a first position to a closed investment position along a second path to form said enclosed investment volume,

said paths being non-coincident,

molding means including means to invest particulate mold material and a binder into said enclosed investment volume to create a hardenable mold having a first cavity created by a first pattern at said first pattern plate and a second cavity created by a second pattern at said second pattern plate facing in a direction opposite to that of said first cavity,

the first and second patterns having first and second axes, respectively, transverse to a pattern plate surface to which the patterns are adapted to be mounted which are non-coincident and disposed at an acute angle to the horizontal,

means to act on said particulate mold material and binder to form a completed mold,

and means to control said power means to relatively separate said molding chamber means and said pattern plates from said closed investment position to said first position.

4,143,701

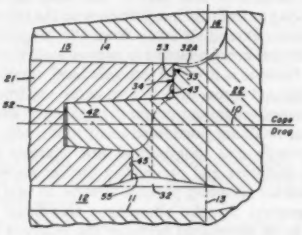
CORE ASSEMBLY IN A COUPLER FOR A RAILWAY VEHICLE

Frank W. Oshinsky, McKeesport, and Thomas R. Brown, Sr., Pittsburgh, both of Pa., assignors to McConway & Torley Corporation, Pittsburgh, Pa.

Filed Jul. 13, 1977, Ser. No. 815,325

Int. Cl.[2] B22C 9/10, 9/24

U.S. Cl. 164—368 **11 Claims**

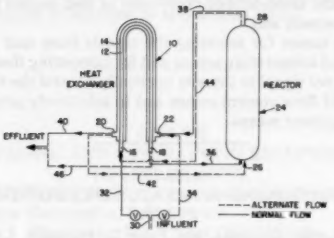


1. A core assembly for use in a sand mold for casting a hollow section in a coupler head of a coupler for a railway vehicle, said coupler head extending continuously beyond a horn line at the rear of the coupler head into a coupler shank of the casting, said core assembly including head and shank core members having face surfaces each including a recessed surface and a projected surface arranged such that the recessed surface in the head core receives the projected surface in the shank core and the recessed surface in the shank core receives the projected surface in the head core to maintain the head and shank cores in an aligned abutting relation while supported in a sand mold for casting the coupler, said face surfaces of the head and shank core members extending transverse of the coupler shank along a parting line spaced rearwardly of a plane containing the horn line of the coupler head.

4,143,702
REVERSE FLOW HEAT EXCHANGERS

James W. Barr, Jr., Rothschild, Wis., assignor to Sterling Drug, Inc., NY, N.Y.

Continuation-in-part of Ser. No. 608,242, Aug. 27, 1975, abandoned. This application Jun. 22, 1977, Ser. No. 808,976
Int. Cl.[2] F28G 9/00
U.S. Cl. 165—1 3 Claims

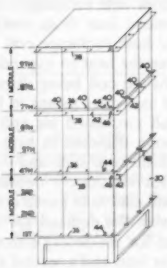


1. The method of descaling a heat exchanger which includes a pair of noncommunicating passages in side-by-side heat exchange relation used for thermally conditioning a liquid and there being a reactor and a valved pipe circuitry with respect to said pair of noncommunicating passages, wherein the method comprises flowing during a first period influent liquid through one of said passages where the influent liquid is heated by a reactor thermally conditioning the influent liquid within the reactor whereby the liquid is further heated and exits from the reactor as a hot effluent liquid, passing the hot effluent liquid from the reactor through the other of said passages in counter-current heat exchange relationship with said influent liquid in said one of said passages, then during a second period flowing the influent liquid through said other of said passages in the same direction as previously traversed by said hot effluent liquid, while flowing the hot effluent liquid through said one of said passages in the same direction previously traversed by said influent liquid.

4,143,703
THERMODYNAMICALLY INTEGRATED BUILDINGS

William E. Creswick, Sault Ste. Marie, and Cyril F. T. Rounthwaite, Toronto, both of Canada, assignors to Isothermic Systems Limited, Sault Ste. Marie, Canada

Continuation of Ser. No. 663,206, Mar. 2, 1976, abandoned, which is a division of Ser. No. 425,771, Dec. 18, 1973, Pat. No. 3,948,314, which is a continuation-in-part of Ser. No. 231,600, Mar. 3, 1972, abandoned. This application Sep. 16, 1977, Ser. No. 834,056
Int. Cl.[2] F25B 29/00
U.S. Cl. 165—1 5 Claims



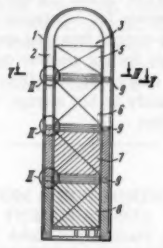
2. The method of at least partially thermally isolating the interior of a building from external heating and cooling loads comprising:

forming said outer walls from a plurality of contiguous, liquid tight, hollow panels with each panel including an outwardly facing wall portion in thermal communication with the external atmosphere and an inwardly facing wall portion spaced from the outwardly facing wall portion and in thermal communication with the interior of the building structure, flowing a liquid through each panel with the liquid being in direct contact with the inner surfaces of said outwardly and inwardly facing wall portions for each panel, and maintaining the flowing liquid and hence said panels through which it is passing at a substantially constant temperature substantially the same as the temperature of the building interior whereby the flowing liquid absorbs the exterior heating and cooling loads and thus assists in maintaining the building interior at a substantially uniform temperature.

4,143,704
REGENERATIVE HEATER

Gennady P. Kandakov, Sevastopolsky prospekt, 51, korpus 2, kv. 163; Viktor Y. Miller, Perekopskaya ulitsa, 11, korpus 4, kv. 41; Lev A. Sorokin, ulitsa Udaltsova, 4, kv. 124, and Alexandr E. Sukhorukov, ulitsa Akademika Koroleva, 3a, kv. 29, all of Moscow, U.S.S.R.

Filed Oct. 25, 1977, Ser. No. 844,897
Int. Cl.[2] F28D 17/00
U.S. Cl. 165—9.2 3 Claims



1. A regenerative heater, comprising a wall and checker brickwork of refractory materials having different coefficients of linear expansion, said wall and checker brickwork being encased within a jacket and comprising superimposed horizontal sections corresponding to the distribution of internal operating temperatures of the regenerative heater and transition sections to diminish the relative displacement of the horizontal sections caused by heat expansion; each of said horizontal sections being made of a homogeneous refractory material; each of said transition sections being disposed between said horizontal sections and formed by at least one course of refractory materials of horizontal sections contiguous to said transition section, the refractory material of one section being uniformly distributed within that of the other section.

4,143,705
STORAGE FOR HEAT AND COLD

Thomas Y. Awalt, Jr., P.O. Box 1053, Pensacola, Fla. 32595

Continuation-in-part of Ser. No. 540,866, Jan. 14, 1975, and a continuation-in-part of Ser. No. 791,848, Apr. 28, 1977. This application Aug. 1, 1977, Ser. No. 820,738
Int. Cl.[2] F24J 3/02
U.S. Cl. 165—18 4 Claims

1. The combination with a shelter having a living space of an air-conditioning system comprising:

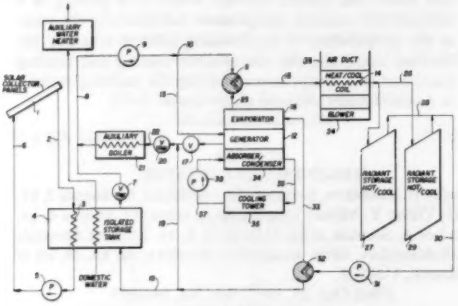
(1) at least one weather-sensitive energy harnessing means including means for producing a hot liquid:

(2) a liquid first alternately hot and cold storage subsystem comprising at least one container interior to the living space having insulated walls, a substantial portion thereof

being in potentially direct radiant heat transfer relationship with the living space, having adjustably regulated removable insulation shielding between the container and the living space:

(3) a second hot liquid storage sub-system comprising at least one container permanently insulation shielded and isolated from the living space:

(4) means for producing a cool liquid:



(5) interconnecting liquid transmission and return means between (1) and (3), (3) and (2), and (4) and (2), including valve control means for separating the first and second heat storage sub-systems into cold and hot storage sub-systems respectively for hot weather cooling operation, and alternately for employing said first and second sub-systems concomitantly as hot storage sub-systems for cold weather operation.

4,143,706

CLIMATE CONTROL FOR A MOTOR VEHICLE COMPARTMENT

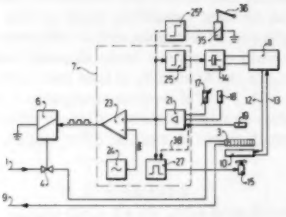
Eberhard Schnaibel, Hemmingen; Erich Junginger, Stuttgart; Ernst Linder, Muhlacker, and Wilhelm Hertfelder, Steinenbronn, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 29, 1977, Ser. No. 820,497

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1976, 2634015

Int. Cl.[2] F25B *29/00*; B60H *3/04*

U.S. Cl. 165—26 **14 Claims**



1. An apparatus for controlling the temperature of a motor vehicle compartment, comprising, in combination:

a source of heated fluid;

a first heat exchanger, connected to said source of heated fluid and provided with flow control means to regulate the flow of heated fluid in said first heat exchanger; for heating air passing therethrough;

refrigerator means, including a second heat exchanger for cooling air passing therethrough, said second heat exchanger being disposed in the stream of air passing through said first heat exchanger;

a set-point generator for generating a set-point signal related to a desired compartment temperature;

first temperature sensor means, disposed in said compartment for sensing the compartment temperature;

second temperature sensor means, disposed near the air outlet of said first heat exchanger, for sensing the temperature of the heated air leaving said first heat exchanger, the coefficient of signal change per unit temperature change of said first temperature sensor being substantially greater than the same-defined coefficient of said second temperature sensor; and

control means for summing the signals from said first and second temperature sensor and for comparing them to said set-point signal to thereby cyclically control the operation of said flow control means and to selectively actuate said refrigerator means.

4,143,707

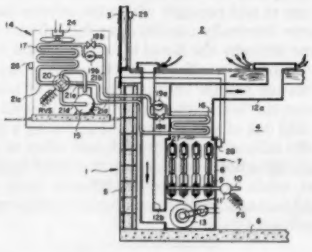
AIR CONDITIONING APPARATUS INCLUDING A HEAT PUMP

Carl M. Lewis, Onalaska, and Peter D. Ferguson, La Crosse, both of Wis., assignors to The Trane Company, La Crosse, Wis.

Filed Nov. 21, 1977, Ser. No. 853,361

Int. Cl.[2] F25B *13/00*

U.S. Cl. 165—28 **2 Claims**



1. Apparatus for conditioning the air within an indoor space comprising:

a. a housing including first heat transfer means for selectively heating air passing therethrough;

b. duct means connected to said housing for providing communication between said housing and said indoor space;

c. indoor fan means for circulating air through said housing and said duct means to said indoor space;

d. a heat pump selectively operable in at least a heating mode including a compressor, indoor heat exchange coil, expansion means, outdoor heat exchange coil, and conduit means for connecting same in a closed refrigerant circuit whereby said indoor heat exchange coil may operate as a condenser to remove heat from compressed refrigerant and said outdoor heat exchange coil may operate as an evaporator to transfer heat to expanded refrigerant, said indoor heat exchange coil being disposed within one of said housing and said duct means in heat exchange relationship with said circulated air and said outdoor heat exchange coil being disposed in heat exchange relationship with an ambient heat sink; and

e. control means for selectively operating said first heat transfer means and said heat pump comprising

i. means for sensing the demand for heat within said indoor space and for producing a first signal in response to a demand for heat and a second signal in response to satisfaction of said demand for heat;

ii. means for sensing the temperature of said ambient heat sink and for producing an override signal when said ambient temperature drops below a predetermined value;

iii. first means for initiating operation of said heat pump in

said heating mode in response to said first signal and terminating operation thereof in response to said second signal;

iv. fourth means responsive to said override signal for preventing operation of said heat pump in said heating mode in response to said first signal; and

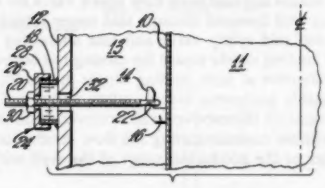
v. fifth means responsive to said override signal for effecting operation of said first heat transfer means in response to said first signal and terminating operation thereof in response to said second signal.

4,143,708

SALVAGING AND RESTRAINING RECUPERATOR FROM COLLAPSE

Eugene M. Haynes, Hebron, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 11, 1977, Ser. No. 841,498
Int. Cl.² F28F *1/32*
U.S. Cl. 165—76 **6 Claims**



1. Heat exchange apparatus comprising:

a first tubular member having hookable means thereon;

a second tubular member generally coaxial with said first member and disposed outwardly thereof so as to define a fluid flow zone therebetween, said second member having at least one passage therethrough in communication with said fluid flow zone and including an outwardly disposed passage-circumscribing ring;

a rod member extending inwardly through said passage into said flow zone, hook means carried by the inward end of said rod in hooked relationship with said hookable means;

an apertured cap disposed coaxially about said rod outwardly of said second tubular member and means substantially simultaneously compressingly holding said cap against said ring member to provide a seal therebetween while outwardly tensioning said rod member to thereby hold said first tubular member in a position restrained against collapse.

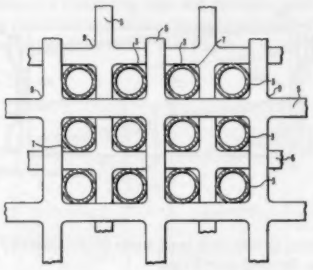
4,143,709

TUBE SUPPORT SYSTEM

Richard C. Cunningham, Pleasant Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 15, 1977, Ser. No. 777,863
Int. Cl.² F28F *9/00*
U.S. Cl. 165—172 **5 Claims**

1. A tube support system for closely packed tubes disposed in a heat exchanger, said tube support system comprising at least two spaced apart support plates transversely disposed with respect to said tubes, each support plate being integrally formed from a single sheet and having a plurality of holes which accept a plurality of tubes, adjacent plates having the holes offset so that adjacent plates cooperate to support the tubes against lateral movement, minimize the contact surface



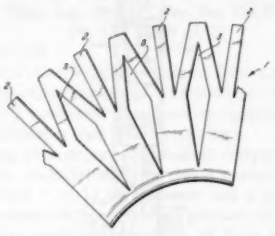
between the tubes and the support plates, and maximize the flow of fluid across the support plates.

4,143,710

HEAT TRANSFER FIN STRUCTURE

Gerald E. La Porte, East Brunswick; Charles L. Osterkorn, N. Brunswick, and Salvatore M. Marino, East Brunswick, all of N.J., assignors to Fedders Corporation, Edison, N.J.

Filed Feb. 9, 1977, Ser. No. 766,955
Int. Cl.² F28F *01/36*
U.S. Cl. 165—182 **2 Claims**



2. In combination, a conduit and a heat transfer fin structure, said heat transfer fin structure being disposed circumferentially about at least a portion of said conduit and consisting of a plurality of elongated leg portions spaced apart from each other and forming a first row; and a plurality of openings defined by said structure, spaced apart from each other and disposed between adjacent leg portions, each said opening being elongated and substantially diamond shaped with the longer axis of said diamond shape being substantially equidistant from and in a plane defined by the adjacent of said leg portions.

4,143,711

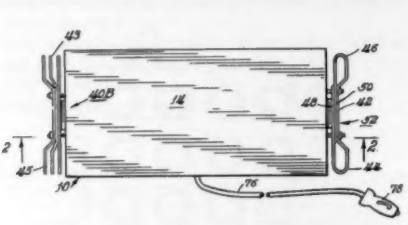
PORTABLE REFRIGERATOR UNIT

Shlomo Beitner, Tel-Aviv, Israel, assignor to Bipol Ltd., Israel

Division of Ser. No. 708,569, Jul. 26, 1976, Pat. No. 4,107,934.
This application Mar. 31, 1978, Ser. No. 892,074
Int. Cl.² F28F *7/00*; F25B *21/02*
U.S. Cl. 165—185 **3 Claims**

1. A heat dissipator which comprises a thermal sink of heat-conducting material comprising a plurality of sheets having portions lapped in heat transfer contact with each other to

form a flat central portion and laterally extending portions spaced from each other to permit the free flow of ambient air



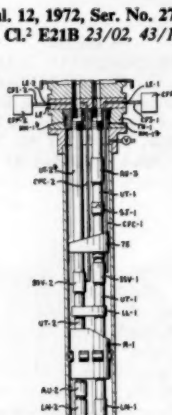
between them, in which at least some of the laterally extending portions are formed into loops.

4,143,712

APPARATUS FOR TREATING OR COMPLETING WELLS

Henry J. James, Dallas, and Carter R. Young, Lewisville, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Jul. 12, 1972, Ser. No. 270,977
Int. Cl.[2] E21B *23/02, 43/12*
U.S. Cl. 166—72 **2 Claims**



1. In a well having a plurality of producing formation zones and a casing supported therein communicating with each of said producing zones, a well flow control system comprising:

a plurality of flow conductors in said well each communicating separately with one of said plurality of producing zones in said well;

support means for supporting the upper end of each of said flow conductors below the surface in said casing;

seal means carried by said support means for sealing between said support means and said casing between said support means and each of said flow conductors;

receptacle means carried by said support means having a plurality of separate longitudinal bores each communicating separately with one of said flow conductors supported by said support means;

a plurality of upper tubing string portions each having its lower end sealingly engaged in a separate one of said separate longitudinal bores in said receptacle means in flow communication with a separate flow conductor below said support means;

means for connecting said upper tubing string portions together above their lower ends for conjoint movement;

means for releasably anchoring the lower end of at least one of said upper tubing string portions in said receptacle means;

conduit means for conducting fluid under pressure from a point above said seal means on said support means to a point therebelow between said casing and said flow conductors;

an offset landing nipple in one flow conductor having a laterally offset receptacle and a bore in alignment and flow communication with the bore of the flow conductor in which the offset landing nipple is connected

independently installable and removable back-flow check valve means releasably insertable into and removable from said offset landing nipple for controlling flow through the conduit means from above the seal means past the check valve means to the annulus below the seal means;

said check valve means being removable through the bore of the flow conductor and upper tubing section thereabove in which offset landing nipple is connected;

safety valve means connected in each of said upper tubing string portions above the lower ends thereof;

control fluid conduit means extending from the surface to said safety valves for controlling the actuation of each of said safety valves from the surface;

landing nipple means in each of said fluid conductors below said seal means and said back flow check valve for receiving a plug tool lowered through said upper tubing string portion and said safety valve and said anchoring means into said landing nipple means for closing the bores of the flow conductors at such landing nipple means to permit the releasable anchoring means, safety valve, and upper tubing extension thereabove to be removed from the well casing without communicating the flow conductors with each other or the producing zones of the well with each other;

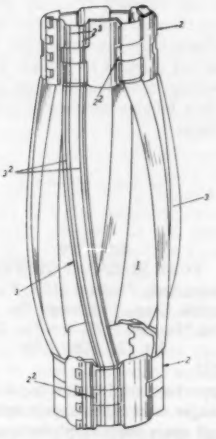
and means at the surface sensing predetermined conditions in the well flow conductor above the safety valves or at the surface to control the application of control fluid pressure to each of the safety valves to control actuation thereof between open and closed positions.

4,143,713

SELF-CENTERING BASKET

Günter Kreft, 5, Hermann-Löns-Weg, D-4520 Melle 1, Fed. Rep. of Germany

Filed Oct. 25, 1977, Ser. No. 844,993
Int. Cl.[2] E21B *17/10*
U.S. Cl. 166—241 **4 Claims**



1. A safety centering basket, for use on casing in boreholes, comprising:

(i) spaced retaining rings each formed of two half-shells releasably connected together

(ii) a plurality of resilient bars disposed in side by side spaced relationship and each engaged at its respective ends with the rings,

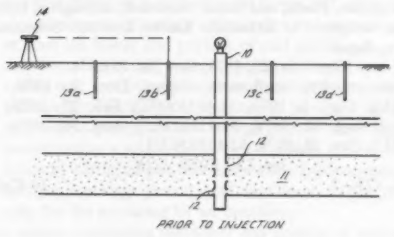
each half-shell having an internal lug for each bar engaged therewith, each half-shell having recessing on its inner face opposite to each such lug, each resilient bar being convexly shaped along its length and having at least in the region of each end and on its outer face, projection means adapted to engage into the recessing of the half-shell, the lug being passed about the bar and engaged through an opening in the half-shell so as to bear by a free end portion against the outer face of the half-shell, whereby said bars are locked against circumferential movement with respect to the ring by the lug and by the engagement of the projection means in the recessing.

4,143,714

METHOD FOR MONITORING UNDERGROUND FLUID MOVEMENT FOR IMPROVING RECOVERY OF OIL OR BITUMEN

George H. Agnew, Calgary, Canada, assignor to Texaco Exploration Canada Ltd., Canada

Filed Aug. 19, 1977, Ser. No. 826,015
Int. Cl.[2] E21B *47/00*
U.S. Cl. 166—252 **11 Claims**



1. A method for monitoring underground fluid movement under a particular surface area of ground at the end of predetermined periods of time comprising the steps of,

(a) positioning bench marks on the ground over the area spaced a predetermined distance apart,

(b) measuring and recording the precise vertical displacement of each bench mark at the end of each predetermined period of time as the fluid is flowing underground,

(c) interconnecting bench marks of similar vertical displacements to form curved lines for forming a contour map of the particular surface area, and

(d) forming each curved line to indicate a particular and different amount of vertical displacement of the ground relative to each particular and different amount of fluid passing underground at a particular and different time.

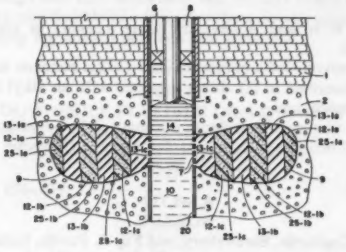
4,143,715

METHOD FOR BRINGING A WELL UNDER CONTROL

Joseph P. Pavlich, Houston, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 782,268, Mar. 28, 1977, Pat. No. 4,078,609. This application Jan. 6, 1978, Ser. No. 867,553
Int. Cl.[2] E21B *33/138, 35/00, 43/26*
U.S. Cl. 166—271 **4 Claims**

1. In a method for bringing under control a first well which penetrates a subterranean formation and which is producing fluids at an uncontrolled rate, wherein a well-controlling fluid is indirectly injected into the first well by injecting the fluid into a second well, forcing said fluid through the formation separating the two wells, and thence into the first well until the first well is brought under control, and wherein prior to injecting said well-controlling fluid into the second well, the formation between said wells is fractured to establish or improve fluid communication between the wells, said fracturing operation including injecting at least two stages of a viscous non-Newtonian fracturing fluid carrying a solid into a fracture in said formation at a fracturing rate and pressure, and temporarily reducing said fluid injection rates and pressures at least once between the first and the last of said stages to close the fracture



at least partially, the improvement which comprises: immediately preceding the temporary rate and pressure reducing step, injecting in sequence both

(a) a non-Newtonian viscous fracturing fluid substantially free of solids and

(b) an inefficient penetrating fluid substantially free of solids, all of said injections being made via the second well.

4,143,716

TERTIARY OIL RECOVERY PROCESS UTILIZING A PREFLUSH

George Kalfoglou, Houston, and Kenoth H. Flournoy, Levelland, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Aug. 30, 1976, Ser. No. 718,993
Int. Cl.[2] E21B *43/22*
U.S. Cl. 166—274 **4 Claims**

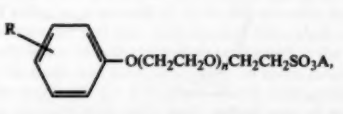
1. A method of recovering petroleum from a porous, subterranean, petroleum-containing formation containing saline water which is penetrated by at least one injection well and at least one production well which comprises:

(a) injecting an aqueous preflush fluid comprising a mixture of water, colloidal silica having a particle size ranging from about 7 to 15 millimicrons and a random, linear, water-soluble friction-reducing polymer of a monomer or monomers consisting essentially of from about 1 to 100 percent by weight of (3-acrylamido-3-methyl) butyl trimethyl ammonium chloride and from 0 to 99 percent by weight of acrylamide or partially hydrolyzed acrylamide wherein the said aqueous preflush fluid has a salinity less than the salinity of the formation water, into the formation, via an injection well,

(b) injecting an aqueous surfactant solution into the formation via the injection well, and

(c) recovering petroleum displaced by the said injections through a production well, wherein the said aqueous surfactant solution of step (b) comprises an aqueous solution of a surfactant composition selected from the group consisting of:

(I) a polyethoxylated alkyl benzene sulfonate having the formula:



wherein R is alkyl of from 8 to 22 carbon atoms, n is an integer of from 2 to about 10 and A is selected from the group consisting of hydrogen, sodium, potassium and the ammonium ion,

a polyethoxylated alcohol sulfate having the formula:

$$RO(CH_2CH_2O)_mSO_3A,$$

wherein R and A have the same meaning as previously described and m is an integer of from 2 to about 18, or a polyethoxylated alcohol sulfonate having the formula

$$RO(CH_2CH_2O)_{m-1}CH_2CH_2SO_3A$$

wherein R, m and A have the same meaning as previously described

(II) a mixture of a polyethoxylated alkyl benzene sulfonate as described in (I) above together with an alkyl benzene sulfonate, and

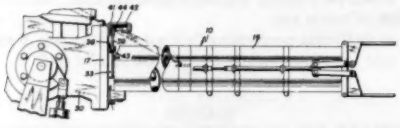
(III) a mixture of petroleum sulfonate and a polyethoxylated alkyl benzene sulfonate as described in (I) above.

4,143,717

NOZZLE

John P. Gagliardo, Shrewsbury, and Fay A. Purvis, Sutton, both of Mass., assignors to Feecon Corporation, Westboro, Mass.

Filed Sep. 19, 1977, Ser. No. 834,704
Int. Cl.[2] B05B 7/12
U.S. Cl. 169—15 **10 Claims**



1. A nozzle, comprising:

(a) an inner tube,

(b) an outer tube generally concentric with the inner tube,

(c) a fixed wall element extending inwardly of the inner surface of the outer tube, the wall element having a plurality of apertures extending axially therethrough,

(d) a movable wall element is rotatably mounted adjacent the fixed wall element, the movable wall element having a plurality of apertures extending therethrough, and

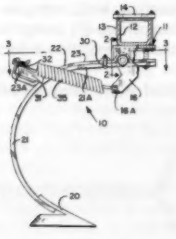
(e) means for rotating the movable wall element from a first position in which the apertures in the movable wall element are not congruent with apertures in the fixed wall element and fluid flows through the inner tube only to a second position in which they are congruent and fluid flows through both tubes.

4,143,718

EARTH WORKING TOOL AND SUPPORT ASSEMBLY THEREFOR

Sherman H. Quanbeck, Aneta, N. Dak. 58212

Filed Sep. 1, 1977, Ser. No. 829,714
Int. Cl.[2] A01B 61/04
U.S. Cl. 172—705 **9 Claims**



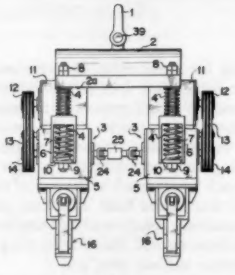
1. A support for a pivoting earth working tool including a main mounting bracket, an earth working tool shank comprising a curved spring shank member having an upper portion and a lower portion, an earth working tool attached to said lower portion, and means to mount said upper portion to said main mounting bracket comprising a shank backing member curved to conform to a section of the upper portion of said curved spring shank member and conforming generally to at least a portion of the curved shape of said curved spring shank member, said shank backing member having a forwardly extending portion overlying the upper portion of said spring shank member, a pivot member fixedly mounted to said backing member at the the forwardly extending portion thereof, means to pivotally mount said pivot member to said main mounting bracket, means adjacent the pivot member and separate therefrom to clamp said curved spring shank member to said shank backing member to form an assembly which pivots about the axis of said pivot member relative to said main mounting bracket, and means connected to said shank backing member to hold the earth working tool in a working position including a tension spring positioned to exert resilient force tending to resist upward pivotal movement of said shank backing member and said spring shank member under load on said earth working tool, said shank backing member permitting the spring shank member to flex under load to distribute stresses along the shank backing member.

4,143,719

MULTI-VIBRO PILE HAMMER

Ken Furukawa, Zushi, and Sadao Nunotani, Kanagawa, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Feb. 25, 1977, Ser. No. 771,974
Claims priority, application Japan, Dec. 3, 1976, 51-161429[U]; Dec. 3, 1976, 51-161430[U]; Feb. 27, 1976, 51-21822[U]; Aug. 30, 1976, 51-115021[U]; Aug. 30, 1976, 51-115022[U]; Dec. 28, 1976, 52-175326[U]
Int. Cl.[2] E02D 7/18
U.S. Cl. 173—1 **14 Claims**



2. A multi-vibro pile hammer comprising:

(a) a plurality of vibro pile hammers installed in parallel to one another, each said vibro pile hammer comprising driving means, vibration generating means including means to elminate lateral vibrations, power transmission means for connecting and driving said driving means and said vibration generating means, clamping means attached to said vibration generating means and spring means for suspending said vibro pile hammer, wherein each vibration generating means generates vertical vibrations having a phase opposite to that of the adjacent vibration generating means;

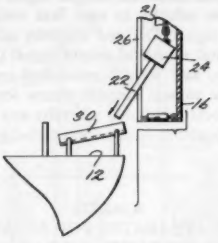
(b) stand or frame means for suspending said plurality of vibro pile hammers parallel to one another, and;

(c) coupling means for interconnecting and synchronizing the vibration generating means of the plurality of vibro pile hammers such that the adjacent vibration generating means generate the vibrations of opposite phase, the opposite phase vibrations reacting with each other to thereby eliminate the vertical vibrations transmitted through the ground between the piles.

4,143,720
METHOD AND APPARATUS FOR TAKING CORE SAMPLES

Sam M. Verdin, 2600 Breton Dr., Marrero, La. 70072

Filed May 16, 1977, Ser. No. 797,248
Int. Cl.[2] E21B 7/12
U.S. Cl. 175—5 11 Claims



1. In a system for taking a core sample from a submerged bottom:

an elongated vertical guide supportable by a floating vessel in an over-water position, said guide having an internal vertical guide passage open at its lower end and a vertical slot communicating with said passage and extending along at least the lower end portion of said guide;

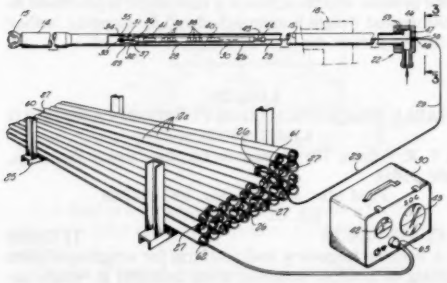
a core barrel assembly suspendable at its upper end from a cable, said assembly being loosely slidable in said guide passage and including a core barrel having a lower end adapted to penetrate the submerged bottom, said core barrel having a width dimension less than that of said slot whereby tilting of said assembly while cable-suspended in said guide passage permits said core barrel to pass through said slot for servicing by an operator;

and means preventing the upper end portion of said assembly from passing through said slot whereby said guide prevents uncontrolled swinging of the cable-supported assembly resulting from wave action on the vessel.

4,143,721
CHANGE IN LENGTH OF DRILL STRING CONTAINING AN INSTRUMENT

Bernard R. Zuvela, and Raymond W. Teys, both of Fountain Valley, Calif., assignors to Scientific Drilling Controls, Newport Beach, Calif.

Filed Oct. 3, 1977, Ser. No. 838,804
Int. Cl.[2] E21B 47/02
U.S. Cl. 175—45 16 Claims



1. The method that comprises:

drilling a hole into the earth using a drill string formed of a series of interconnected tubular pipe sections having drilling means at an inner end of the string;

carrying in said drill string an instrument having a flexible conductive line extending from the instrument through the drill string to a unit at the surface of the earth;

changing the length of the drill string by successively moving different pipe sections between a storage location near the hole and a position of connection to the outer end of the string;

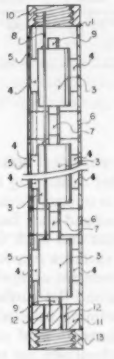
threading said flexible line through the drill string and through said pipe sections at said storage location; and

leaving said flexible line threaded through said pipe sections as they are moved between said locations.

4,143,722
DOWNHOLE FLEXIBLE DRIVE SYSTEM

W. B. Driver, 19 Sheridan Rd., Arnold, Md. 21012

Filed Aug. 25, 1977, Ser. No. 827,689
Int. Cl.[2] E21B 7/04, 1/06
U.S. Cl. 175—95 2 Claims



1. An improved flexible drive system for the boring of directional well holes comprises an assembly of motors being comprised of a plurality of double shaft downhole electrical motors, each motor having a housing a flexible shaft connecting the respective downhole ends and uphole ends of said double shafts of said electrical motors providing a flexible connection between said electrical motors, a flexible assembly comprising a plurality of tube sections, each said tube section enclosing a housing of said electrical motors, inside diameter of said tube sections being larger than the outside diameter of said electrical motors, a plurality of supports attached to the inside wall of each said tube section connects to the respective electrical motor and supports said electrical motors so the axial center of said tube sections and said electrical motors will be the same, a plurality of flexible tubes, each said flexible tube connecting the respective ends of said tube sections between said electrical motors enclosing said flexible shafts and providing a means for drilling fluids to be pumped through said system and with said flexible shafts providing a flexible point in said system between said electrical motors, a drive shaft, uphole end of said drive shaft connected to the downhole of said double shaft of the electrical motor located at the downhole end of said assembly of motors, said tube section which encloses said housing of said electrical motor located at the downhole end of said assembly of motors being long enough in length to enclose all but the downhole end portion of said drive shaft, diameter of said drive shaft being large enough to be in contact with the inside wall of said tube section that encloses said drive shaft and still turn, downhole end of said drive shaft connected to the uphole end of a downhole tool joint, a plurality of holes constructed through the length of said drive shaft so said drilling fluids can be pumped through said drive shaft, uphole end of said tube section enclosing said electrical motor located at the uphole end of said assembly of motors connected to the downhole end of a uphole tool joint, an electrical power line extending down through said uphole tool joint between said electrical motors

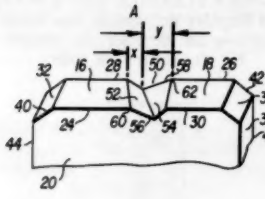
and the inside wall of said tube sections connecting to each said electrical motor and providing electrical power to each said electrical motor.

4,143,723

CARBIDE TIPPED DRILL BIT FOR BORING HOLES IN CONCRETE AND STEEL

Norman H. Schmotzer, 2532 Palmarito Rd., West Palm Beach, Fla. 33406

Filed Oct. 4, 1977, Ser. No. 839,314
Int. Cl.[2] F21C *13/01*; B23B *51/02*
U.S. Cl. 175—410 **11 Claims**



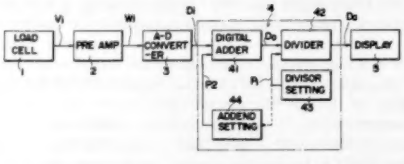
1. A drill for forming cylindrical holes in both concrete and steel, said drill having a bit containing a carbide tip with first and second flat surfaces on opposite sides of the central axis of said drill and having a front and back face extending parallel to said central axis, said front and back faces intersecting with said first and second flat surfaces respectively to form cutting edges wherein the improvement comprises a notch extending between said first and second flat surfaces and said front and back faces, said notch defining sidewalls and having cutting edges formed by the intersection of said sidewalls and said front and back faces to effectively cut said concrete and steel.

4,143,724

ELECTRONIC WEIGHING APPARATUS

Seiichi Itani, Sakai, Japan, assignor to Kubota Ltd., Osaka, Japan

Filed Jan. 21, 1977, Ser. No. 761,418
Claims priority, application Japan, Jan. 24, 1976, 51-6947
Int. Cl.[2] G01G *19/413*
U.S. Cl. 177—25 **20 Claims**



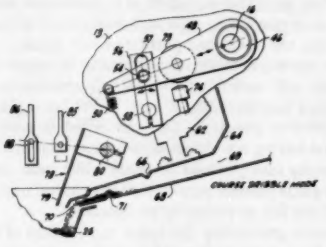
1. An electronic weighing apparatus for converting an analog electrical signal representing the weight of an article being weighed, to a digital electrical signal of a given resolution, comprising: analog signal means responsive to the weight of an article being weighed for providing said analog electrical signal representing the weight of said article, analog-to-digital converter means responsive to said analog electrical signal for converting said analog electrical signal into a first digital electrical signal (Di) representing the weight of said article at the output of said analog-to-digital converter whereby said first digital electrical signal (Di) is subject to the differential non-linearity inherent in said analog-to-digital converter means, adder means coupled to said analog-to-digital converter means for adding a digital electrical addend signal value (P2) to said first weight representing digital electrical signal (Di) for providing a sum digital electrical signal (Do), whereby said first weight representing digital electrical signal is shifted by said digital electrical addend signal value (P2) toward an improved analog - to - digital transfer function, divider means coupled to said adder means for dividing said sum digital electrical signal (Do) by a digital electrical divisor signal value (P1) for providing a second weight representing digital electrical output signal (Da) at the output of said divider means, said electrical addend signal value (P2) having a fixed relationship to said electrical divisor signal value (P1) such that said second weight representing digital electrical output signal (Da) has an improved resolution relative to said first weight representing digital electrical signal (Di), and whereby said second weight representing digital electrical output signal (Da) has a determined relation to said weight associated analog signal, and means responsive to said divider means for displaying said second digital electrical signal, whereby any differential non-linearity error occurring in said analog-to-digital converting is mimimized.

4,143,725

METHOD AND APPARATUS FOR SEPARATING BULK ELONGATED PRODUCTS INTO QUANTITIES OF PREDETERMINED WEIGHT

Rene J. Gaubert, 4219 Oakmore Rd., Oakland, Calif. 94602

Filed Sep. 27, 1977, Ser. No. 837,217
Int. Cl.[2] G01G *13/02*
U.S. Cl. 177—123 **21 Claims**



1. An apparatus for separating bulk elongated products into quantities of predetermined weight, comprising:

(a) a weighing chute for receiving a predetermined volume of elongated product which is short of a desired predetermined weight and for receiving the elongated product dribbled therein as the weight of the product in the chute is brought up to the desired predetermined weight;

(b) weighing means connected to the chute;

(c) means actuated by the weighing means for producing a plurality of control responses as the amount of the product in the chute approaches the desired predetermined weight and when the desired weight is achieved; and

(d) means responsive to said control responses for dribbling the product into the chute at a rate which is decreased as the desired weight is approached and for stopping further dribbling when the desired weight is achieved.

4,143,726

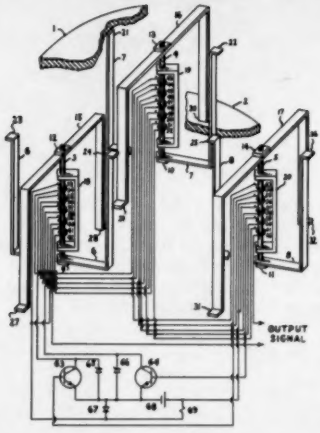
VARIABLE FREQUENCY LOAD PLATFORM AND LOAD LIMIT SWITCH

John T. R. Wilson, 736 Lynnhaven La., La Canada Flintridge, Calif. 91011

Filed Mar. 31, 1978, Ser. No. 892,303
Int. Cl.[2] G01G *3/14*
U.S. Cl. 177—210 FP **11 Claims**

1. A variable frequency load platform for weighing objects consisting of multiple magnetic stress members in which mechanical stress is induced by the platform load and in which the members magnetic characteristics are changed by said mechanical stress, stress members mechanical stress application means consisting of a load platform plate connected only to one end of said stress members and a baseplate means connected to the other end of said stress members, multiple mag-

netic yokes each completing one closed magnetic flux path through one said stress member from near one end of one said stress member to near the other end of said one member through standard fit joints between said one member and said one yoke, multiple multiple winding means in which one multiple winding means inductively links one flux path means, a magnetic multivibrator utilizing said multiple multiple winding means in which the frequency of oscillation is principally



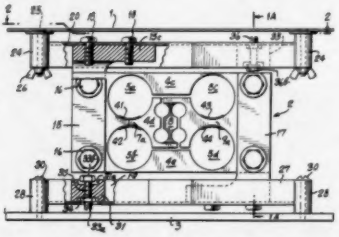
determined by the time required to drive magnetic flux in synchronism through each said flux path and reciprocally between one polarity near-maximum flux level and the opposite polarity near-maximum flux level, and an output signal winding means inductively linking each said flux path and series-additive connected for deriving an induced output signal from said multivibrator in which the fundamental frequency represents the sum of the loads applied to said multiple members and thus the load applied to said platform.

4,143,727

LEVERLESS SCALE SENSOR

Walter E. Jacobson, Meriden, Conn., assignor to Revere Corporation of America, Wallingford, Conn.

Filed Mar. 30, 1977, Ser. No. 782,714
Int. Cl.[2] G01G *3/14, 3/08;* G01L *5/12*
U.S. Cl. 177—211 **3 Claims**



1. A load cell for converting variations in a force into variations in a force into variations in an electrical condition, comprising:

a. a pair of spaced, relatively rigid, parallel members extending in the direction of a force to be measured;

b. a pair of spaced, relatively flexible, parallel members extending between the relatively rigid members at right angles thereto and connected only thereto;

c. a fifth member extending between the relatively rigid members at right angles thereto and connected only thereto, said fifth member being located between and spaced from said flexible members and comprising:

1. two flexible elements, respectively fixed at one end to respective ones of said pair of relatively rigid members and having their opposite ends extending therefrom toward the other of said pair of relatively rigid members, said opposite ends being spaced and aligned in said direction; and

2. a flexure element connected between said opposite ends of said two flexible elements and extending in said direction, said flexure element being stressed longitudinally by said force and having four semicylindrical notches, one on each of its side faces adjacent each end thereof, said notches making said element laterally flexible in response to forces perpendicular to said force to be measured so that substantially only a force parallel to said force to be measured is transmitted through said fifth member; and

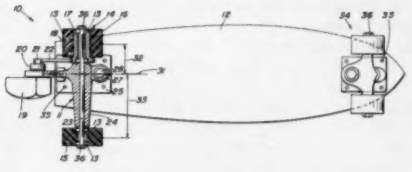
d. electrical strain responsive means on at least one of the flexible elements for converting strain variations therein to variations in an electrical condition which measures said force and is unaffected by moments due to eccentric application of said force to one of said rigid members.

4,143,728

MOTORIZED SKATEBOARD

Samuel Shiber, P.O. Box 1302, Des Plaines, Ill. 60018

Filed Jan. 6, 1977, Ser. No. 757,459
Int. Cl.[2] A63C *17/00*
U.S. Cl. 180—1 G **1 Claim**



1. A motorized skateboard, having a first end and a second end, comprising in combination:

a skateboard board,

an axle supporting a first end of said board,

a drive axle supporting a second end of said board through a pivoting connection, said drive axle having a first end and a second end,

a drive wheel rotateably supported on said first end of said drive axle,

an idler wheel rotateably supported on said second end of said drive axle, and

a prime mover coupled to said drive wheel,

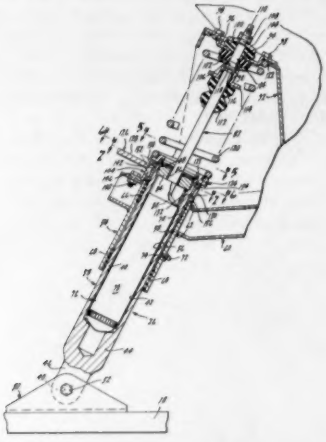
the improvement wherein the distance between said pivoting connection and said idler wheel is substantially longer than the distance between said pivoting connection and said drive wheel so that the weight supported by said drive wheel is substantially greater than the weight supported by said idler wheel for substantially increasing traction of said drive wheel.

4,143,729

SNOW VEHICLE SUSPENSION SYSTEM

Burke A. West, and Michael R. Bethell, both of Monroe, Mich., assignors to Monroe Auto Equipment Company, Monroe, Mich.

Continuation of Ser. No. 517,866, Oct. 25, 1974, Pat. No. 3,977,485. This application Aug. 26, 1976, Ser. No. 718,027
The portion of the term of this patent subsequent to Aug. 31, 1992, has been disclaimed.
Int. Cl.[2] B62M *27/00*
U.S. Cl. 180—5 R 30 Claims



1. A suspension strut for a snow vehicle having at least one steerable ski,

said strut comprising first and second telescopically slidable housings, one of said housings being fixedly secured to an associated portion of the vehicle,

means on one of said housings for securing said strut directly to the steerable ski,

shock absorbing means within one of said housings and including a damping piston cooperable with a quantity of damping fluid, and a piston rod extending axially from one end of said strut,

said shock absorbing means being operable to dampen relative telescopic movement between said first and second housings,

a helical coil spring means arranged coaxially of said strut, said spring means comprising the main suspension spring for said ski and yieldably resisting movement of said ski toward the vehicle, and

a steering element for rotating said ski relative to the vehicle upon actuation of an associated vehicle steering mechanism,

said steering element being connected to one of said housing members and being rotatable therewith about an axis extending generally coaxially of said strut when a steering force is applied to said element by said associated vehicle steering mechanism.

4,143,730

AUXILIARY UNIT FOR DRIVING A BICYCLE

Albert D. Desmond, 1730 W. Galena, Apt. 203E, Aurora, Ill. 60506

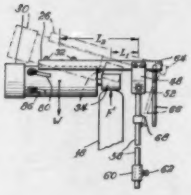
Filed Apr. 20, 1978, Ser. No. 898,155
Int. Cl.[2] B62M *11/08*
U.S. Cl. 180—33 D 10 Claims

1. An electrically operated auxiliary unit for driving a lightweight cycle and constructed to be mounted upon the cycle frame, comprising

a motor support frame having an elongated, horizontal bar longitudinally oriented and located at one side and near the top of a wheel of the cycle,

means for mounting said horizontal bar on the cycle frame,

a generally horizontal arm pivotally mounted at one end of said horizontal bar and extending transversely over the wheel of the cycle,



motor means secured to said horizontal arm near the distal end thereof whereby the center of gravity of said motor means is located on the opposite side of the wheel from the location of said horizontal bar, and

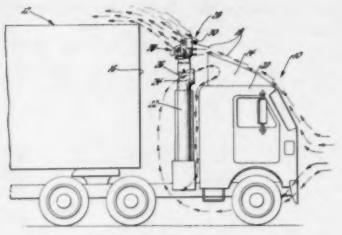
a drive pulley attached to said motor means and positioned to engage the top of the wheel of the cycle.

4,143,731

EXHAUST FLOW DIRECTIONAL DEVICE

Norman E. Haustein, Auburn Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 22, 1977, Ser. No. 863,318
Int. Cl.[2] F01N *7/20*
U.S. Cl. 180—64 A 2 Claims



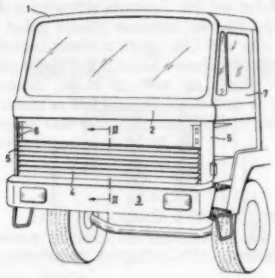
1. In a tractor having a roof mounted air deflector and an engine exhaust pipe located behind the air deflector and having an opening discharging engine exhaust into the deflected airflow, an exhaust flow directional device comprising: a semicylindrical airfoil, means mounting the airfoil on the exhaust pipe adjacent the exhaust pipe opening and in the deflected airflow upstream of the exhaust pipe opening to split the deflected airflow around the exhaust pipe, said airfoil having a semicylindrical pervious portion located generally below the exhaust pipe opening allowing airflow therethrough to prevent low pressure behind the pervious portion of the airfoil and a semicylindrical impervious portion located generally above the exhaust pipe opening to create a low pressure behind the impervious portion of the airfoil and above the exhaust opening to thereby draw the exhaust flow upwardly into the deflected airflow.

4,143,732

ORNAMENTAL GRILL FOR A MOTOR VEHICLE BODY

Leonhard Schmude, Neu-Ulm; Luan P. Hasnay, Ulm; Dieter V. Amende, Neu-Ulm, and Peter Lettermann, Bernstadt, all of Fed. Rep. of Germany, assignors to Magirus-Deutz Aktiengesellschaft, Ulm, Fed. Rep. of Germany

Filed Oct. 12, 1977, Ser. No. 841,610
Int. Cl.[2] B60K *11/04, 11/08*
U.S. Cl. 180—68 P 4 Claims



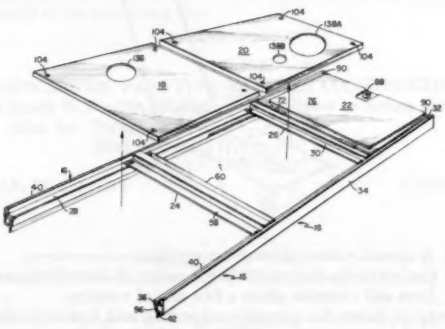
1. A grill for a motor vehicle body, especially for the front section of a driver's cab of a truck, which comprises in combination a panel having a length equalling at least the major portion of the width of the vehicle for which said grill is intended and having a multi-Z-shaped cross section transverse to said length of said panel, each Z-shaped section of said multi-Z-shaped cross section having two arms substantially parallel and in spaced relationship to each other, each two adjacent Z-shaped sections merging with each other and having one of its two substantially parallel arms in common, each Z-shaped section also having a third arm connected and inclined to its two substantially parallel arms, at least one of said two substantially parallel arms of each Z-shaped section being provided with a corner having an air passage therethrough, those portions of adjacent Z-shaped sections which merge with each other alternately forming front and rear ribs, said air passages being located between said front and rear ribs, the insides of said rear ribs defining longitudinal channels open at both ends.

4,143,733

HOOD PANEL SUPPORT STRUCTURE

Michael E. Morello, Sandwich, and Thomas E. Cochran, Yorkville, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 11, 1977, Ser. No. 814,592
Int. Cl.[2] B62D *25/12*
U.S. Cl. 180—69 R 15 Claims



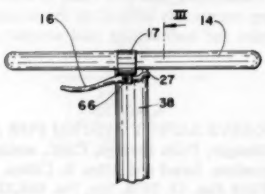
1. A hood panel support structure for a vehicle engine compartment access opening closure, wherein said closure includes a plurality of separate hood panels, mounting and support means for said panels including laterally spaced longitudinal side beam members and a plurality of longitudinally spaced cross beam members operatively attached at the ends thereof to said side beam members, said side beam members respectively including an outer rail portion having an upper nose portion, a horizontal inturned web portion, and a downward flange adapted for operatively mounting said side beam members to a frame of the vehicle, said side beam members further including an angle portion secured at the bottom thereof to said rail portion and having a horizontal flange spaced below the top of said nose portion, said horizontal flange constituting a mount for said cross beams, said cross beams including a horizontal web below the top thereof, said horizontal flanges of said side beam angle portions and said horizontal webs of said cross beams comprising coacting mounting and support means for said panels in a plurality of recessed panel positioning and support compartments in a longitudinal array, and said panels being individually and separately removably inserted and secured in said recessed compartments.

4,143,734

MANUAL CONTROL DEVICE FOR AUTOMOTIVE VEHICLE

Bishnu P. Bhattacharya, 364 Rindge Ave., Apt. 17C, Cambridge, Mass. 02140

Filed Sep. 10, 1976, Ser. No. 722,152
Int. Cl.[2] B60K *26/02;* G05G *13/00*
U.S. Cl. 180—77 R 1 Claim



1. A manual control device for an automotive vehicle having a steering column, a steering wheel rotatably mounted on the steering column, an accelerator pedal and a brake pedal, said manual control device comprising

a pivotable bar having spaced opposite first and second ends, said pivotable bar being pivotally affixed to the steering column in spaced relation with the steering wheel at a point equidistant from the first and second ends thereof;

a securing plate affixed to said steering column between said steering wheel and said pivotable bar and spaced from said wheel and said bar, said securing plate having diametrically opposite first and second points;

a first sleeve on part of the accelerator pedal;

a second sleeve on part of the brake pedal;

a first hand grip;

a first pivotal connector pivotally affixing said first hand grip to said steering wheel; said first pivotal connector having a spring for maintaining said first hand grip open, said first hand grip having a free end;

a second hand grip;

a second pivotal connector pivotally affixing said second hand grip to said steering wheel in spaced opposite relation with said first hand grip, said second pivotal connector having a spring for maintaining said second hand grip open, said second hand grip having a free end;

a first flexible tube supported by said steering column and extending from the free end of said first hand grip to the first point of said securing plate;

a second flexible tube supported by said steering column and extending from the free end of said second hand grip to the second point of said securing plate;

a first cable slidably extending through said first tube and having a first end affixed to the free end of said first hand grip and a spaced opposite second end affixed to the first end of said pivotable bar;

a second cable slidably extending through said second tube and having a first end affixed to the free end of said second hand grip and a spaced opposite second end affixed to the second end of said pivotable bar;

a first rod having a first end affixed to the first end of said pivotable bar and a spaced opposite second end affixed to said first sleeve;

a second rod having a first end affixed to the second end of said pivotable bar and a spaced opposite second end affixed to said second sleeve;

a first collar in said first tube in the area of the second end thereof;

a second collar in said second tube in the area of the second end thereof;

a first spring around said first cable in said first tube, said first spring having a first end abutting said first collar and a spaced opposite second end beneath said first end;

a first washer affixed to said first cable in said first tube and abutting the second end of said first spring;

a second spring around said second cable in said second tube, said second spring having a first end abutting said second collar and a spaced opposite second end beneath said first end;

a second washer affixed to said second cable in said second tube and abutting the second end of said second spring;

a first cap removably affixed to the second end of said first tube for maintaining said first cable in open position; and

a second cap removably affixed to the second end of said second tube for maintaining said second cable in open position.

4,143,735

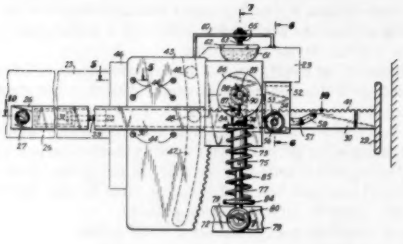
ANTI-NOSE-DIVE SAFETY SYSTEM FOR A VEHICLE

Samuel L. Schlanger, Palm Springs, Calif., assignor to Gail B. Mauer, Jerusalem, Israel and Ellen R. Cohen, Wayne, N.J.

Filed Jan. 13, 1978, Ser. No. 869,333

Int. Cl.[2] B62D *39/00*

U.S. Cl. 180—91 **15 Claims**



1. An anti-nose-dive safety system for a vehicle having a chassis, including two parallel spaced-apart legs and a front end axle assembly for each of the front wheels, comprising:

a bumper assembly including a frame, one end of which is pivotably mountable on said chassis legs adjacent to the front end thereof and a retractable bumper slidably mounted on said frame for movement between a normal, extended position and a retracted position;

a front end suspension assembly including an air piston arrestor, pivotably coupled between each of the front end axle assemblies and said bumper assembly frame;

means coupled to said bumper assembly and said chassis for raising the front end of said chassis in response to movement of said bumper from said normal position to said retracted position thereof; and

means for arresting said air piston arrestors in a relatively rigid, non-compressible state in response to movement of said bumper from said normal position to said retracted position thereof.

4,143,736

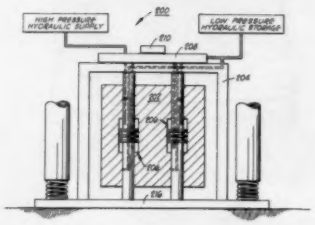
SEISMIC TRANSDUCER CONSTRUCTION

Delbert W. Fair, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Nov. 3, 1977, Ser. No. 848,224

Int. Cl.[2] G01V *1/14*

U.S. Cl. 181—119 **14 Claims**



1. A transducer for inducing waves in an elastic medium, comprising:

a single mass member having a plurality of parallel offset cylinder bores extending therethrough;

a piston member having a piston and oppositely extending piston rods reciprocally disposed in each cylinder bore and each rod extends out each side of said mass,

means for simultaneously introducing fluid under pressure into each cylinder bore, alternately on opposite sides of each piston, and concurrently on the same sides of the several pistons, for simultaneously reciprocating the piston members in concert, relative to the mass member; and

a frame interconnecting the ends of the oppositely extending piston rods, the frame having means thereon for engaging a surface of the elastic medium.

4,143,737

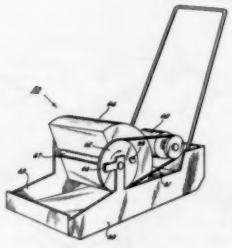
ROTATING ECCENTRIC WEIGHT SEISMIC SOURCES AND A SEISMIC EXPLORATION METHOD

Otis G. Erich, Jr., Brea, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Feb. 4, 1977, Ser. No. 765,799

Int. Cl.[2] G01V *1/14, 1/04*

U.S. Cl. 181—121 **24 Claims**



1. A seismic source apparatus comprising:

a first rotatable element having a center of mass displaced from and rotatable about a first axis of rotation;

support means for rotatably supporting said first rotatable element;

drive means for rotating said first rotatable element about said first axis of rotation; and

position sensor means for directly detecting the instants that

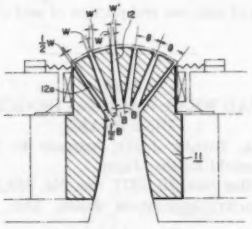
the center of mass of said first rotatable element passes that angular position about said first axis of rotation at which said apparatus develops the peak earthward force during each revolution of said first rotatable element, said position sensor means including two components (1) an actuator and (2) a pulse generator which generates a discrete electrical pulse each time said actuator passes in close proximity to said pulse generator, one of said components being fixedly mounted on said first rotatable element so as to rotate about said first axis of rotation with said first rotatable element, and the other of said components being fixedly mounted on said support means at a preselected position about said first axis of rotation, said preselected position being selected such that the rotating component passes in close proximity to the stationary component at and only at the instant at which the center of mass of said first rotatable element passes said angular position.

4,143,738

LOUDSPEAKER DRIVER UNIT

Jiro Nakazono; Akihiko Kodama, and Yukio Tsuchiya, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 26, 1978, Ser. No. 872,708
Claims priority, application Japan, Jan. 29, 1977, 52-9662[U]
Int. Cl.[2] G10K *13/00*; H04R *7/00*
U.S. Cl. 181—159 **1 Claim**



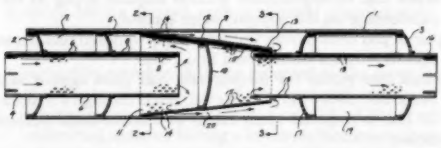
1. In a driver unit for a horn type loudspeaker of the type comprising a dome-shaped diaphragm and an equalizer positioned on the concave side of said diaphragm, said equalizer having a convex surface adjacent said diaphragm and a plurality of slits extending from said convex surface to an interior, outwardly opening throat, said slits being disposed in equal angular pitch and, except for the outermost slits adjacent the edge of the convex surface of said equalizer, being equal in width, the improvement wherein said outermost slits are disposed at the edge of the convex surface of said equalizer and the width of said outermost slits is approximately one half the width of the remaining slits.

4,143,739

CONCENTRIC PASS-TYPE MUFFLER CONSTRUCTION

Kenneth D. Nordlie, Madison, Wis., assignor to Nelson Industries, Inc., Stoughton, Wis.

Filed May 9, 1977, Ser. No. 795,005
Int. Cl.[2] F01N *1/08*
U.S. Cl. 181—265 **8 Claims**



1. A muffler construction, a casing, inlet conduit means connected to the casing for introducing an exhaust gas to the casing, outlet conduit means connected to the casing for discharging the gas from the casing, an inner body disposed within the casing and having an upstream end communicating with the inlet conduit means and having a downstream end communicating with the outlet conduit means, baffle means disposed between the ends of the inner body, each end of said body having a generally oval cross-sectional configuration with a major axis and a minor axis, the portions of said body that define said major axes being secured to the casing and the portions of said body that define said minor axes being spaced from the casing to provide a passage for the flow of exhaust gas, the major axis of the upstream end of the body being displaced circumferentially from the major axis of the downstream end of the body.

4,143,740

MODULAR STAIRWAY SYSTEM FOR INSTALLATION ON STRUCTURES HAVING NON-LINEAR WALLS

Wesley D. Matthews, Mechanicsburg, Ill., assignor to Floyd G. Matthews, Mechanicsburg, Ill.

Filed Dec. 27, 1977, Ser. No. 864,242
Int. Cl.[2] E04F *11/04*
U.S. Cl. 182—93 **7 Claims**

1. A modular stairway system for structures having non-linear walls comprising:

a plurality of first stringer means;

a plurality of first connecting means for joining the first stringers;

a plurality of second stringer means horizontally spaced from and parallel to the first stringer means;

a plurality of adjustable second connecting means for adjustably joining the second stringers such that the combination of first and second stringers conform to the curvature of the structure;

a plurality of stairs horizontally interposed between the first and second stringers;

a stair mounting means for securing the stairs to the first and second stringers;

mounting bracket means for securing the first stringers to the structure; and

brace means for supporting the second stringer to the structure,

whereby the stairway system may be easily installed on structures having non-linear walls.

4,143,741

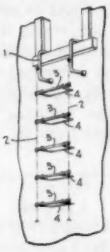
PORTABLE ESCAPE LADDER

Anthony J. Souza, Lancaster, and William E. Askins, Lititz, both of Pa., assignors to Woodstream Corporation, Lititz, Pa.

Filed Dec. 30, 1977, Ser. No. 865,984
Int. Cl.[2] E06C *1/36, 1/56*
U.S. Cl. 182—198 **8 Claims**

1. A rung for a portable escape ladder, said rung comprising an elongate member having substantially coplanar flattened end portions, each end portion including a bifurcated section

comprising a pair of limis extending substantially in the longitudinal direction of said elongate member and having free ends defining a transverse edge of said elongate member, said limbs defining therebetween an opening through said flattened portion and a slit leading from said opening to said edge, said limbs being deformable in regions adjacent said slit to alter the effective width of said slit whereby a junction of a pair of interconnected chain links can be passed along said slit from said edge into said opening with the respective links of said pair embracing respective ones of said limbs and whereby said junction can then be captively held in said opening by deforming said limbs suitably to reduce the width of said slit to prevent passage therealong of said junction.



4,143,742

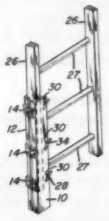
LADDER EXTENSION APPARATUS

Albert Fernandez, 2208 W. Virginia Ave., Clarksburg, W. Va. 26301

Filed Jul. 20, 1978, Ser. No. 926,307

Int. Cl.[2] E06C *7/44*

U.S. Cl. 182—201 **4 Claims**



1. A ladder rail extension device comprising:

a. at least three bolts;

b. a pair of diametrically disposed L-shaped side members which together form a U-channel, one L-shaped member has at least three threaded holes sized to receive the bolts and the other L-shaped member has an equal number of larger holes, sized so as to permit a bolt to hang loosely from the side member when not engaged in a threaded hole;

c. a keeper attached to each bolt to prevent the bolt from slipping out of the oversized hole; and

d. a hinge member attached to the side member to permit the U-channel to be opened in order to insert the ladder rail.

4,143,743

EAVES LADDER GRIP

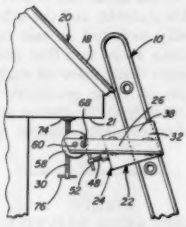
Dale W. Larson, 74 Sparta Ave., Eveleth, Minn. 55734

Filed Jun. 5, 1978, Ser. No. 912,247

Int. Cl.[2] E06C *5/36, 7/48*

U.S. Cl. 182—206 **11 Claims**

1. A bracket for a ladder, said bracket including mounting means for support from a ladder at a predetermined point spaced therealong, an elongated support arm having one end supported from said mounting means with the other end of said support arm projecting outwardly from said mounting means in a direction therefrom to be oriented at generally right angles relative to a plane containing the associated ladder when said bracket is supported therefrom, an angularly displaceable mount supported on said other end of said support arm for oscillation about an axis transverse to said arm, and an elongated clamp arm supported from said mount for oscillation therewith relative to said support arm, said clamp arm being disposed at generally right angles relative to said axis and swingable with said mount, during its oscillation relative to said support arm, in a plane generally paralleling said support arm, said clamp arm including one end portion thereof supported, relative to said mount, for lengthwise advancement and retraction of said one end portion of said clamp relative to said mount.



4,143,744

FRICTION-PAD WEAR WARNING DEVICE FOR USE IN DISC BRAKE

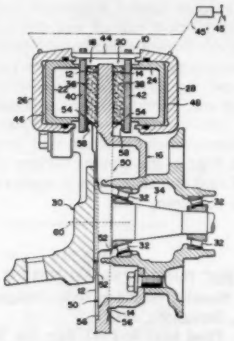
Hiroyuki Oka, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Nov. 10, 1977, Ser. No. 850,307

Claims priority, application Japan, Dec. 23, 1976, 51-171836[U]

Int. Cl.[2] F16D *66/02*

U.S. Cl. 188—1 A **5 Claims**



1. A friction-pad wear warning device for use in a disc brake, comprising:

a brake disc having annular friction surfaces along its circumference on the opposite sides thereof;

a pair of pad units having friction pads in opposed relation to said friction surfaces of said brake disc;

at least one piston for forcing said pad units against said brake disc under the pressure delivered through a hydraulic line in response to an extent of a brake pedal pushed down;

an annular portion which is continuously provided in said brake disc at least on one side thereof adjacent to said

friction surfaces and along the circumference of said brake disc, a major part of the surface of the one side of said annular portion being gradually inclined in the circumferential direction and being disposed in an inclined plane; and

a pressure bearing portion provided on the side of said friction pad in said pad unit opposed to said brake disc, said pressure bearing portion being forced against said inclined surface of said annular portion due to said pedal being pushed down, when said friction pad is worn down beyond a wear limit, whereby cyclic reaction of said inclined annular surface of said annular portion, which is given to said pressure bearing portion, may be delivered via said hydraulic line to said pedal in the form of pulsation, the inclination of said annular surface of said annular portion causes only one cycle of substantially continuously varied back and forth displacement in the direction perpendicular thereto for each rotation of said brake disc.

4,143,745

HOLDER APPARATUS FOR PULLING-UP WIRE IN CENTER PULL TYPE CALIPER BRAKE

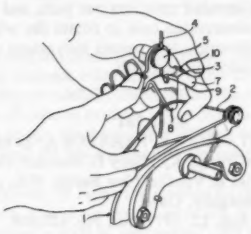
Kunihiko Yoshikawa, Soka, Japan, assignor to Kabushiki Kaisha Yoshikawa Seisakusho, Yashio, Japan

Filed Oct. 5, 1977, Ser. No. 839,737

Claims priority, application Japan, May 27, 1977, 52-67610[U]

Int. Cl.[2] B62L *1/12*

U.S. Cl. 188—24 **2 Claims**



1. A holder apparatus for pulling-up a wire in a center pull type caliper brake where a holder member is provided at its upper portion with a wire screw for fastening an operation wire and at its lower portion with a hook portion for hooking a pulling-up wire, wherein: the holder member is provided with a pair of finger members projecting at the rear and on both sides of the hook portion, said hook portion being defined by a groove formed by respective front and rear side wall members, and with a guide member disposed at the front side of said hook portion for pulling-up a wire projecting downwardly from the hook portion.

4,143,746

HAND REEL

A. J. Lowery, 867 Sandell, White Settlement, Tex. 76108

Filed Jan. 30, 1978, Ser. No. 873,112

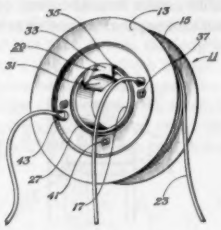
Int. Cl.[2] B65H *75/40*; H02G *11/02*

U.S. Cl. 191—12.4 **8 Claims**

8. An improved hand reel, comprising:

a spool having flanges with a channel therebetween for receiving line, and a bore therein of sufficient size to accomodate the hand of the user; and

a supporting member slidingly mounted to the spool inside the bore to allow rotation of the spool with respect to the supporting member for winding on and off the line, the supporting member having a lower surface inside the bore adapted to be grasped by the hand of the user and extending along the periphery of the bore for a length substantially less than the circumference of the bore and means for connecting said supporting member to said spool to



retain said supporting member in sliding contact with said spool.

4,143,747

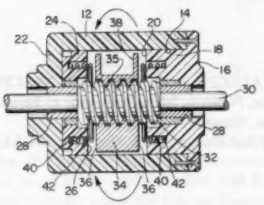
COASTER BRAKE

Michael Langieri, Jr., 8 Cedar St., Butler, N.J. 07405, and Robert H. De Graaff, 20 Kennedy Dr., Flanders, N.J. 07836

Filed Sep. 2, 1977, Ser. No. 830,348

Int. Cl.[2] F16D *41/00, 67/02*

U.S. Cl. 192—89 W **8 Claims**



1. A drive mechanism comprising a hub, said hub having contact faces at opposite inner ends thereof, an axle longitudinally extending through said hub and supported thereby for rotation in opposite directions, said axle having a threaded screw portion disposed within said hub and an eccentrically weighted driver threadably mounted upon said screw portion and within said hub for non-rotational longitudinal movement therewith whereby rotation of said axle in opposite directions traverses said driver from side to side into driving contact with said opposite faces of said hub thereby imparting driving force in opposite directions to said hub.

4,143,748

DISENGAGING BEARING FOR CLUTCHES OF MOTOR VEHICLES

Paul Maucher, Sasbach, Fed. Rep. of Germany, assignor to LuK Lamellen und Kupplungsbau GmbH, Buhl, Fed. Rep. of Germany

Filed Jul. 26, 1976, Ser. No. 708,296

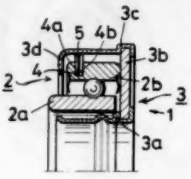
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1975, 2535560

Int. Cl.[2] F16D *23/14*

U.S. Cl. 192—98 **16 Claims**

1. Disengaging device for a clutch comprising support means, an antifriction bearing having one bearing race predisposed to act upon and co-rotate about a rotary axis with disengaging means of the clutch and another bearing race predisposed not to co-rotate with the clutch disengaging means and being actable upon by said support means through a contact surface so as to effect a disengaging movement, and means providing a resistance to displacement in radial direction effective between said support means and said antifriction bearing, said means providing a resistance to displacement comprising

at least one annular holding member elastic in axial direction and disposed around the rotary axis, said holding member being formed of spring steel and being clamped, on one hand, by bracing profile means formed in one of said non-rotating bearing race and said support means so as to be braced direc-



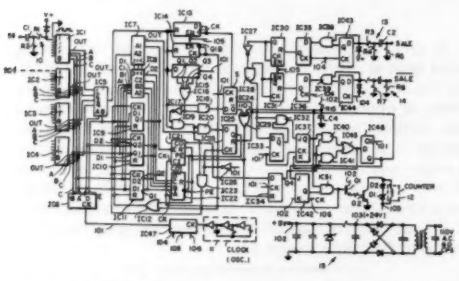
tionally neutral in axial direction, said holding member effectively engaging, on the other hand, the other of said non-rotating bearing race and said support means, so as to hold said non-rotating bearing race and said support means in a respective relative radial position.

4,143,749

TOTALIZER FOR VENDING MACHINE

David M. Otten, Newton, Mass., assignor to International Totalizing System, Newton, Mass.

Filed Dec. 6, 1976, Ser. No. 748,113
Int. Cl.[2] G07F 9/00
U.S. Cl. 194—1 N **13 Claims**



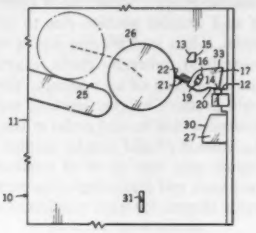
1. A totalizer for use with a multi-price vending machine for vending items and having a plurality of price wires which carry a signal representing the value of an item selected by the user of the vending machine and a device for providing a control signal indicating the sale of the item, said totalizer comprising first means for respectively scanning said wires to detect a value of sale signal, second means for storing the value of sale signal detected, and third means responsive to the control signal for controlling the storage of the value of the sale signal in said second means, said first means comprises a data selector means coupled to said price wires, a first counter for providing signals to said data selector for causing same to scan said price wires, clock means for clocking said first counter, first storage means for storing the count of the first counter after a first detection of a value of sale signal by said data selector, and comparator means responsive to the count in said first counter after the second detection of a value of sale signal by said data selector and the count stored in said storage means for generating a comparison valid signal indicating valid valie value of sale signal has been detected.

4,143,750

SERRATION DETECTOR

Edward L. Heim, Florissant, Mo., assignor to Coin Acceptors, Inc., St. Louis, Mo.

Filed Nov. 4, 1977, Ser. No. 848,586
Int. Cl.[2] G07F 3/02, 3/04
U.S. Cl. 194—97 R **7 Claims**



1. A serration detector in a selector assembly for serrated and nonserrated coins in a coin acceptor and located downstream of a rail on a support which directs a coin in a predetermined trajectory, the serration detector comprising:

(a) a pivotally mounted body, and

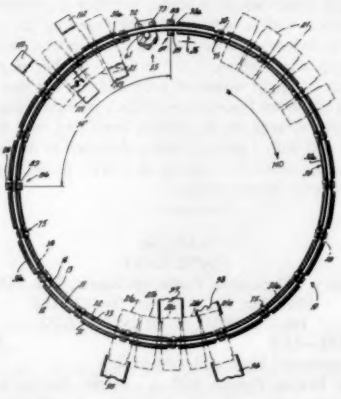
(b) a wire feeler attached to the body and providing a wire portion disposed transverse to and engaging the edge of a coin moving in the predetermined trajectory, the wire portion engaging the serrations of a serrated coin to rotate the wire feeler in one direction to change the trajectory and direct the serrated coin into one path, and engaging a substantially nonserrated coin to rotate the wire feeler in the opposite direction and permit movement of the nonserrated coin into another path.

4,143,751

CIRCULAR SORTATION APPARATUS AND METHODS

Lloyd L. Foster, LaGrange, Ky.; Gary D. Gaarder, Grand Blanc, Mich., and Charles E. Venzke, New Berlin, Wis., assignors to A-T-O Inc., Willoughby, Ohio

Filed Aug. 12, 1977, Ser. No. 823,968
Int. Cl.[2] B65G 47/46
U.S. Cl. 198—365 **14 Claims**



1. Article sorting apparatus comprising:

movable circular ring means comprising a circular beam having a horizontal web and parallel, spaced inner and outer vertical side flanges on each side of said web, and extending above said web,

circular frame means comprising at least curved beam segments underlying said ring means, said beam segments

having a web wider than that of said circular beam of said ring means and also having inner and outer parallel spaced vertical flanges on each side of said wider web, and extending above said wider web,

support means for engaging the web of said ring means and for rotationally supporting said ring means,

guide means engaging a flange of said ring means for guiding said ring means,

tiltable article carrying tray means mounted to said ring means and being tiltable selectively to one of the interior and exterior of said ring means, and

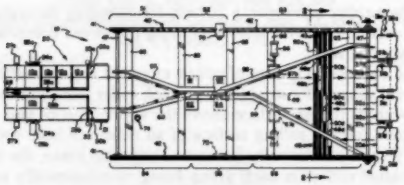
means for selectively tilting said tray means to one of the interior and exterior of said ring means.

4,143,752

MULTIPLE DISTRIBUTION CONVEYOR SYSTEM

Victor Del Rosso, Ithaca, N.Y., assignor to Hi-Speed Checkweigher Co., Inc., Ithaca, N.Y.

Filed Mar. 21, 1977, Ser. No. 779,291
Int. Cl.[2] B65G *43/00*
U.S. Cl. 198—365 **18 Claims**



1. A distribution system for distributing articles to a plurality of receiving stations, wherein the system comprising:

a. a plurality of laterally displaced infeed lines which deliver a flow of articles to their respective discharge ends;

b. means at the discharge end of each of said plurality of infeed lines for controlling the discharge of articles therefrom;

c. a multiplicity of receiving stations having receiving ends;

d, a unitary conveyor means adjacent to and intermediate the discharge ends of said infeed lines and said receiving ends of said receiving stations for transporting said articles from the discharge ends of said infeed lines to said multiplicity of receiving stations; and

e. article deflection means operating in association with said conveyor means for converging the flow of articles received from said plurality of infeed lines into a single line and for diverting a selected number of said articles from said single line to each of said multiplicity of receiving stations in a round robin sequence.

4,143,753

CONVEYING ARRANGEMENT

Torsten E. Bergens, Lessebovägen 122, S-122 47 Enskede, Sweden

Continuation of Ser. No. 177,416, Sep. 2, 1971, abandoned, which is a continuation-in-part of Ser. No. 120,666, Mar. 3, 1971, abandoned. This application Mar. 22, 1976, Ser. No. 669,122
Claims priority, application Sweden, Mar. 3, 1970, 2764/70
Int. Cl.[2] B65G *43/00*
U.S. Cl. 198—370 **1 Claim**

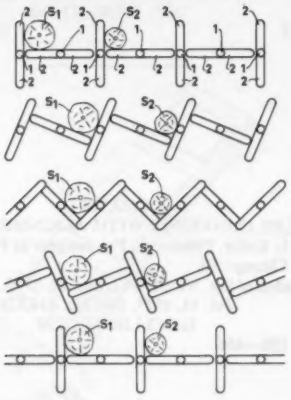
1. An arrangement for the handling of solid bodies, and particularly for the conveyance of solid bodies from one point to another, comprising in combination:

(a) a plurality of rotary shafts arranged in a straight row so that the axes of said shafts are substantially parallel to each other,

(b) two rows of parallel finger-like members attached to opposite sides of said rotary shafts, each finger-like member of each row of finger-like members projecting outwardly at right angles from said rotary shaft, the two rows of finger-like members associated with each rotary shaft lying in a plane which is transverse to the axis of rotation of that rotary shaft,

(c) the distance between adjacent rotary shafts being greater than the length of the finger-like members in a row set forth in (b) but less than double the length of the finger-like members of a row as set forth in (b),

(d) the lateral space between the finger-like members of a row on each rotary shaft being unobstructed so that the finger-like members of the row of finger-like members on the next adjacent rotary shaft can pass through such unobstructed space,



(e) means to rotate all of said rotary shafts and in such a manner that the rows of finger-like members will form a continuous support for solid bodies and so that a solid body placed directly upon the row of finger-like members attached to one rotary shaft will be caused to progressively move laterally onto the row of finger-like members of the next adjacent rotary shaft, and

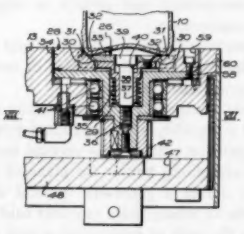
(f) means to at least intermittently interrupt the drive means of at least one of said rotary shafts so that the row of finger-like members on the interrupted rotary shaft will thereafter no longer support a solid body and the solid body will thereby fall beneath the plane of said plurality of rotary shafts.

4,143,754

LABELLING MACHINES WITH ARTICLE GUIDE PLATE

Paul J. Eldred, Sheffield, England, assignor to Morgan Fairest Limited, Sheffield, England

Filed Jul. 7, 1977, Ser. No. 813,449
Int. Cl.[2] B65G *29/00*
U.S. Cl. 198—379 **6 Claims**



1. A labelling machine comprising an article supporting plate, a clamp for pressing an article to the supporting plate, a guide plate with a recess within which the article supporting

plate can move against a spring urge when the clamp moves towards the supporting plate to press an article to it, a plurality of notches spaced round the periphery of the article supporting plate, and a corresponding number of projections on the guide plate extending into the recess and making a sliding fit in the notches in the article supporting plate, with the surfaces of the projections facing the clamp converging towards each other in the direction away from the clamp to align the article in a predetermined position on the supporting plate as the clamp moves toward the supporting plate.

4,143,755

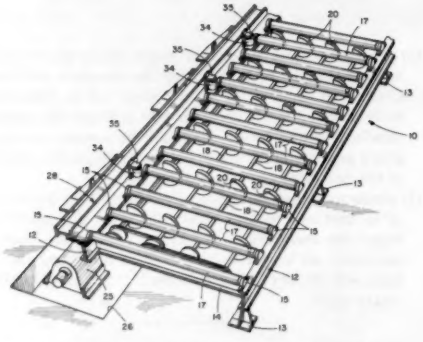
ROLLER CONVEYOR WITH ALIGNMENT DEVICE

Norman L. Keller, Pittsburgh, Pa., assignor to Pullman Incorporated, Chicago, Ill.

Continuation of Ser. No. 617,901, Sep. 29, 1975. This application Jul. 11, 1977, Ser. No. 814,522

Int. Cl.[2] B65G *47/24*

U.S. Cl. 198—456 **8 Claims**



1. A conveyor including a frame having horizontally spaced longitudinally extending frame members,

a plurality of longitudinally spaced conveying roller members journalled on said frame members about generally horizontal and transversely extending axes and defining a conveying surface adapted to support the lower sides of objects carried thereupon,

means for maintaining said objects in alignment on said conveyor comprising

shifting means being extendable above said conveying surface for shifting the objects axially of said rollers above said conveying surface, and

aligning means comprising a support along one side of said frame and a plurality of guide rollers rotatably mounted on the support on substantially vertical axes, said plurality of rollers projecting below the plane of said conveying surface to define a generally vertical aligning surface positionable to substantially intersect said conveying surface along the path of movement of said objects for supported sequential aligning engagement of each of the objects, thereby essentially obviating obstructive jamming of the objects by said aligning means as the objects move along the conveying surface.

4,143,756

CONVEYOR ORIENTATION UNIT

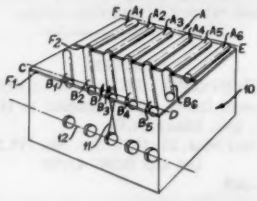
Derek C. Chorlton, Stoke-on-Trent, England, assignor to Conveyor Manufacturing Company Limited, Wednesbury, England

Continuation of Ser. No. 686,271, May 14, 1976. This application Dec. 7, 1977, Ser. No. 858,309

Claims priority, application United Kingdom, May 16, 1975, 20859/75; Oct. 5, 1975, 40885/75

Int. Cl.[2] B65G *47/54*

U.S. Cl. 198—457 **5 Claims**



1. In a roller conveyor, a portion for changing through 90° the direction of travel of articles being conveyed comprising:

a support; and

first and second groups of rollers mounted in juxaposition in said support for axial rotation, each roller being journalled with its rolling surface above the upper level of said support and the rolling surface of all rollers of both groups lying in substantially the same horizontal plane, the individual rollers in each group being of substantially equal and uniform diameter and arranged with their axes of rotation parallel to each other to define a pass-line substantially perpendicular to said axes of rotation, the axes of rotation of one group of rollers being at an angle to the axes of rotation of the other group and the respective pass-lines of each group intersecting at an angle of substantially 45° whereby the articles are turned through 90° by feeding them onto said first group of rollers along a path which is parallel to the axes of said second group of rollers.

4,143,757

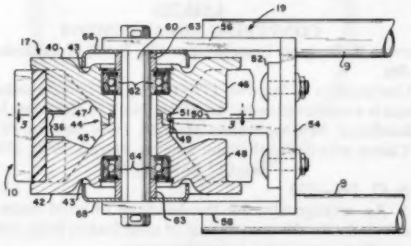
SELF-CLEANING SPROCKET ASSEMBLY

Jerome A. Wallenfang, Appleton, Wis., assignor to Koehring Company, Brookfield, Wis.

Continuation of Ser. No. 713,838, Aug. 12, 1976, abandoned. This application Oct. 18, 1977, Ser. No. 844,422

Int. Cl.[2] B65G *45/00*; F16H *55/30*; A10D *45/02*

U.S. Cl. 198—494 **14 Claims**



1. In a crop handling device having a flexible, toothed driving member exposed to the crop, the improvement comprising:

a self-cleaning sprocket assembly adapted for rotational cooperation with the driving member, the sprocket assembly including a rotatable member including a pair of spaced parallel sidewalls interconnected by a central hub,

the surface of said hub being contoured so as to include a middle section of reduced diameter and additional sections of generally conical configuration extending away from said middle section toward said sidewalls, said sidewalls being spaced apart by a distance slightly greater than the width of said driving member so that the latter is constrained between said sidewalls during engagement with said sprocket assembly;

mounting means supporting said rotatable member for rotation about an axis passing through said hub; and

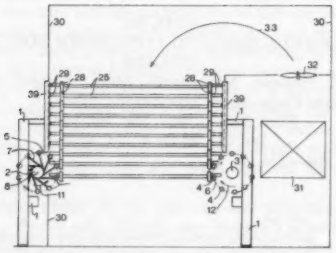
a plurality of drive lugs projecting from the inner surfaces of said sidewalls and arranged to cooperate with the teeth of said driving member, said lugs being arranged in two sets spaced apart axially to form a gap, the latter being disposed in substantial alignment with said middle section, said driving lugs each including an outer bearing surface which engages the inner surface of said driving member.

4,143,758

COOLING OR FREEZING APPARATUS

Hans Gram, Vojens, Denmark, assignor to Brødene Gram A/S, Vojens, Denmark

Filed Aug. 3, 1977, Ser. No. 821,345
Claims priority, application Denmark, Aug. 13, 1976, 3674/76
Int. Cl.² B65G *47/82*
U.S. Cl. 198—624 **3 Claims**



1. A cooling or freezing apparatus comprising

a housing containing means of transport for moving, in a vertical direction, carriers for goods to be cooled or frozen in the apparatus, the carriers stacked one above the other,

the means of transport being arranged at the bottom of the housing and comprising two transport devices, each of which includes a plurality of mutually parallel support rails connected to a shaft by bracket means extending eccentrically with respect to the axis of the shaft, the shaft extending centrally with respect to the corresponding support rails, said support rails being arranged as generatrices of an imaginary cylinder and being rotatable about the axis of the cylinder,

the two transport devices being arranged along the sides of the housing opposite each other and connected to drive means for rotating the oppositely arranged transport devices about the axes thereof in mutually opposite directions,

each of the carriers for the goods being provided with spacer means along the sides of the carriers, the height of the spacer means corresponding to the distance in the vertical direction between two adjacent support rails of a transport device after rotation of the transport device an angle corresponding to the pitch of the support rails from a position in which the two adjacent support rails are positioned vertically above each other,

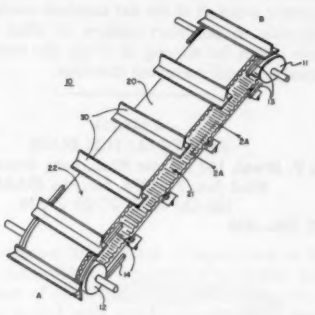
each of said carriers also being provided with laterally extending flap means for engagement with said support rails, the spacing of said flap means in the vertical direction and in the stacked position of the carriers corresponding to the height of said spacer means, said flap means moreover having a length corresponding to the distance in the horizontal direction between two adjacent support rails in the position which such two adjacent support rails occupy after having been rotated one pitch from the position in which such two adjacent support rails are positioned vertically above each other.

4,143,759

POSITIONABLE CLEATS AND ASSOCIATED CONVEYORS

Joseph R. Paradis, 225 Cochituate Rd., Wayland, Mass. 01778

Continuation of Ser. No. 656,577, Feb. 9, 1976, abandoned. This application Apr. 8, 1977, Ser. No. 786,056
Int. Cl.² B65G *15/42*
U.S. Cl. 198—688 **9 Claims**



1. In combination, a positionable conveyor cleat and a conveyor belt having recesses on the underside thereof;

said cleat having a flight formed by a rigid single-piece member with securing means;

said securing means comprising oppositely positioned members having inwardly directed abutments formed thereon securing said flight in at least one recess of said belt;

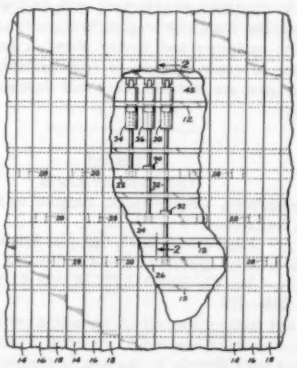
whereby the flight can be removed and repositioned only by deflecting said belt.

4,143,760

RECIPROCATING CONVEYOR

Olof A. Hallstrom, 1350 Hallstrom Rd., Tillamook, Oreg. 97141

Continuation of Ser. No. 540,281, Jan. 10, 1975, abandoned. This application Jul. 22, 1976, Ser. No. 707,877
Int. Cl.² B65G *25/04*
U.S. Cl. 198—750 **4 Claims**



1. A reciprocation conveyor, comprising:

(a) a frame,

(b) at least three elongated slat members mounted adjacent each other on the frame for independent longitudinal reciprocation in a single plane between start and advanced positions,

(c) a plurality of reversible hydraulic drive means one for each slat member, the plurality of drive means interconnecting the frame and the associated slat members for moving all of the slat members from the start position simultaneously in a conveying direction to the advanced position and returning the slat members one at a time back from the advanced position to said start position, and

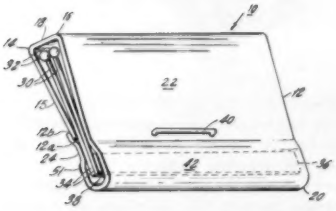
(d) drive control means engaging the plurality of drive means and operable when all of the slat members reach their limit of advanced position to effect reversing the plurality of drive means one at a time for returning the slat members one at a time back to said start position and operable when all of the slat members reach their limit of retraction to said start position to effect reversing the drive means for moving all of the slat members simultaneously in said conveying direction.

4,143,761

SAFETY MATCH BOOK

Francis P. Brand, 163 Lincoln Blvd., Long Beach, N.Y. 11561

Filed Jun. 27, 1975, Ser. No. 591,033
Int. Cl.[2] A24F *27/20, 27/26*
U.S. Cl. 206—106 **9 Claims**



1. A safety match unit including a plurality of match sticks each having a frictionally ignitable head, elongated binding strip means to which the other ends of said match sticks are separably secured, sheet means including a portion forming an elongated pouch into which said binding strip means is entered, the axis of said pouch extending substantially normal to said match sticks, another portion of said sheet means including an openable enclosure wherein said match sticks are disposed, means defining a match striking surface disposed within said pouch, said pouch normally being closed to prevent entry therein of an ignitable head through a side opening of said pouch into operative engagement with said striking surface, and a simulated match striking surface positioned on the exterior of the enclosure and having abrasive qualities that are insufficient to cause ignition of said ignitable match heads when the latter are rubbed against said simulated match striking surface.

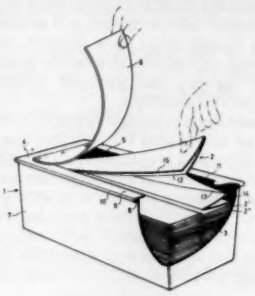
4,143,762

WET-TISSUE RACK

Hans Spiegelberg, Täby, Sweden, assignor to Salve S.A., Fribourg, Switzerland

Filed Feb. 6, 1973, Ser. No. 329,967
Claims priority, application Sweden, Feb. 22, 1972, 2119/72
Int. Cl.[2] B65D *81/22, 83/00, 85/62*
U.S. Cl. 206—210 **20 Claims**

1. A wet tissue dispenser comprising a package of a moisture-proof material adapted to maintain a plurality of folded tissues in a stack therein, an opening formed in one wall of said package, a sealing member attached along one portion thereof to the outer surface of said wall, said sealing member being movable with respect to said attached portion to enable exposure of said opening and having an inherent resiliency and a length, breadth and weight to automatically close said opening



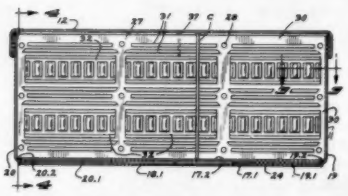
on being released to normally provide a moisture-tight seal with said wall about said opening.

4,143,763

COLLAPSIBLE SHIPPING CONTAINER FOR CIRCUIT BOARDS

James E. Haglund, Minneapolis, Minn., assignor to Central Container Corporation, Minneapolis, Minn.

Filed Dec. 7, 1977, Ser. No. 858,097
Int. Cl.[2] B65D *81/16, 85/62*
U.S. Cl. 206—334 **11 Claims**



1. A shipping box for rigid circuit boards, comprising

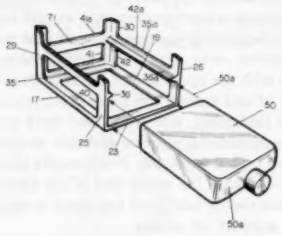
a corrugated cardboard box having upright sidewalls confronting each other and end walls adjoining the sidewalls at the corners of the box, the box also having a bottom formed of inturned flaps attached to the sidewalls and end walls and completely enclosing the bottom of the box interior,

a pair of plastic insert panels in the box and respectively affixed to the opposite sidewalls, the panels having base areas lying flush against the box sidewalls and also having raised plateau areas spaced from the box sidewalls to bear against and cushion the circuit board edges, the plateau areas extending along the sidewalls of the box and into close proximity with the end walls, the plateau areas being bounded by the base areas adjacent the end walls, and the panels also having a plurality of elongate and vertically oriented ribs in spaced and side by side relation on the plateau areas and defining grooves therebetween to receive and retain the edges of the circuit boards therebetween, the ribs and plateau areas of the opposite panels confronting and engaging each other when the inturned flaps are swung downwardly and the box is collapsed with the sidewalls swung adjacent each other.

4,143,764
SHIPPER CONTAINER FOR FLASKS

L. Howard Moss, III, 5236 Vernadale St., Dayton, Ohio 45429

Filed Sep. 20, 1976, Ser. No. 724,997
Int. Cl.[2] B65D *25/04*
U.S. Cl. 206—429 8 Claims



1. A combination shipping package and convenience rack for a plurality of tissue culture flasks having top, bottom, end and side walls and a closured neck opening extending outwardly from said top wall, said combination comprising:

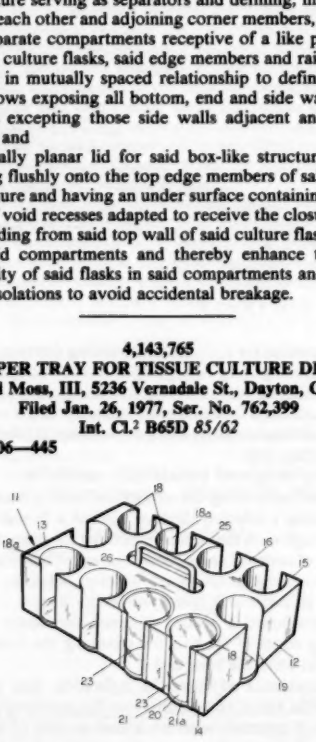
an open, six-side, box-like structure defined by corner, top edge and bottom edge members in spaced relationship, said structure including a plurality of interior slide or rail segments in opposed relationship on either side of said structure serving as separators and defining, in aggregate with each other and adjoining corner members, a plurality of separate compartments receptive of a like plurality of tissue culture flasks, said edge members and rail segments being in mutually spaced relationship to define voids or windows exposing all bottom, end and side walls of said flasks excepting those side walls adjacent an adjoining flask, and

a generally planar lid for said box-like structure, said lid fitting flushly onto the top edge members of said box-like structure and having an under surface containing a plurality of void recesses adapted to receive the closured necks extending from said top wall of said culture flasks located in said compartments and thereby enhance the spatial stability of said flasks in said compartments and the relative isolations to avoid accidental breakage.

4,143,765
SHIPPER TRAY FOR TISSUE CULTURE DISHES

L. Howard Moss, III, 5236 Vernadale St., Dayton, Ohio 45429

Filed Jan. 26, 1977, Ser. No. 762,399
Int. Cl.[2] B65D *85/62*
U.S. Cl. 206—445 6 Claims

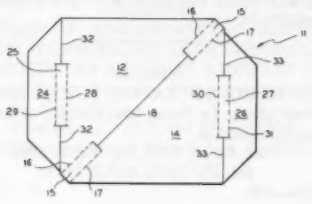


1. A receptacle for convenience shipping, storage and display of a plurality of tissue culture dishes of generally thin configuration, said receptacle comprising a principal body member including a plurality of spaced vertical voids having a horizontal section generally congruent to the configuration of said dishes, said body including a top wall intersected by said voids to define an opening allowing upward movement of dishes in said voids and beyond said opening; said voids intersecting the marginal surface of said body to define vertical slots, accommodating finger manipulation and removal of said dishes, a plurality of dishes located within said voids, and a plurality of removable covers sealing said opening and the vertical slots, to isolate said dishes within their respective chambers as defined by said voids and their respective covers.

4,143,766
DEVICE FOR PROTECTING ARTICLES

David W. Goulde, Knoxville, Tenn., assignor to Container Corporation of America, Chicago, Ill.

Filed Apr. 10, 1978, Ser. No. 894,935
Int. Cl.[2] B65D *85/48*
U.S. Cl. 206—453 3 Claims



1. A device erected from a blank of paperboard, or the like, for receiving and protecting a portion of an article, such as a corner of a sheet of glass, said device comprising:

(a) first and second main panels of substantially triangular configuration overlying each other and being foldably joined to each other along their diagonal edges by a pair of relatively narrow panel hinge strips formed from material of said panels and spaced from each other at opposite corners of said panels with a cut line extending therebetween;

(b) a flap hinged to another edge of at least one of said panels by a relatively narrow flap hinge strip and being sandwiched between said panels thereby providing a slot between said panels;

(c) said slot extending between said panel hinge strips the length of said cut line and forming a pocket for receiving a portion of an article to be protected.

4,143,767
TIRE PATCHING KIT

Kelvyn I. MacDonald, 2248 Wenonah St., Vancouver, B. C., Canada (V5N 2Z6)

Filed Jul. 3, 1978, Ser. No. 921,193
Int. Cl.[2] B65D *73/00, 85/00;* B60C *21/02*
U.S. Cl. 206—582 1 Claim

1. A tire patching kit, comprising

a backing sheet of substantially rectangular configuration having front and back surfaces, a top edge, a spaced paral-

lel bottom edge and a pair of spaced parallel side edges joining the top and bottom edges and perpendicular thereto, said backing sheet having a hole formed therethrough in proximity with the top edge and substantially equidistant between the side edges thereof and a broken line marked on the front surface of the said sheet extending intermediate and parallel to the top and bottom edges of said sheet;

a tire patch removably affixed to the front surface of said sheet in the area defined by the broken line and the bottom edge thereof;

a sheet of abrasive material removably affixed to the tire patch; and

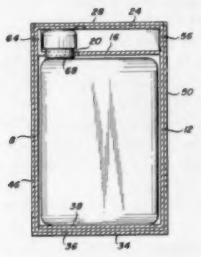
a sealed container of liquid cement for affixing the tire patch to a tire, said container being affixed to the front surface of said sheet in the area defined by the broken line and the top edge thereof and having a narrow neck just crossing said broken line whereby when said backing sheet is cut along said broken line the neck is opened and the cement is available for use.

4,143,768

FOLDED BLANK CONTAINER FOR RECEPTACLES

Roger L. McCulloch, La Porte, Ind., assignor to Boise Cascade Corporation, Boise, Id.

Filed Apr. 6, 1978, Ser. No. 893,935
Int. Cl.[2] B65D *81/02, 85/30*
U.S. Cl. 206—590 **7 Claims**



1. A unitary rectangular blank for forming a shipping container for an article, such as a jug, having an upwardly extending neck portion, said blank including

(a) a plurality of parallel spaced vertical first fold lines defining opposed front and rear panels and a pair of opposed side panels;

(b) a first top panel connected with the upper edge of one of said side panels by a horizontal second fold line;

(c) a second top panel connected with the upper edge of the other of said side panels by a horizontal third fold line, the length of said second top panel being equal to the width of said rear panel;

(d) a third top panel connected with the upper edge of said rear panel by a horizontal fourth fold line, the length of said third top panel being equal to the width of said third side panel;

(e) said third fold line being vertically arranged at a higher elevation than said second fold line by a first distance that corresponds generally with the height of the article neck portion, said first top panel containing a neck-receiving opening;

(f) said front, rear and side panels being foldable to define a first hollow tube for receiving the article, said first top panel being foldable downwardly to a horizontal position in which the article neck portion extends through said neck-receiving opening, said second and third top panels being foldable downwardly toward superimposed contiguous horizontal positions in spaced relation above said first panel;

(g) first support tab means connected with the free end of said second top panel by horizontal fifth fold lines, the length of said first support tab means being equal to said first distance, the free extremity of said first support tab means including locking tongue means adapted for insertion within corresponding locking slot means contained in said second fold line;

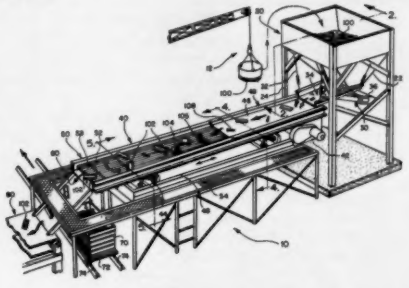
(h) second support tab means connected with the free end of said third top panel by horizontal sixth fold lines, the length of said second support tab means being equal to said first distance, whereby when said second top panel is folded to the horizontal position and said first support tab means are folded vertically downwardly into supporting engagement with the upper end of the adjacent side panel, the free end of said second top panel is supported by said first support tab means, and when said third top panel is folded to the horizontal position and said second support tab means are folded vertically downwardly into supporting engagement with the upper end of the adjacent front panel, the free end of said third top panel is supported by said second support tab means.

4,143,769

APPARATUS FOR SORTING AND SEPARATING DISCRETE ARTICLES

Jack E. Ripple, Crystal Lake, Ill., assignor to Chicago and North Western Transportation Co., Chicago, Ill.

Filed May 2, 1977, Ser. No. 793,135
Int. Cl.[2] B07B *13/04;* **B07C** *5/02*
U.S. Cl. 209—544 **18 Claims**



1. An apparatus for sorting and separating discrete articles of material including irregularly-shaped articles comprising:

an oscillating conveyor having a loading end and a sorting end including a trough therein and adapted for moving the material longitudinally from the loading end forwardly to the sorting end;

a plurality of spaced substantially parallel bars extending longitudinally along the trough and having leading edges projecting a selected distance beyond a forward edge of the trough such that a zone is defined for separating a first group of material and a second group of material containing the irregularly-shaped articles, whereby the first group of material is conveyed on the bars;

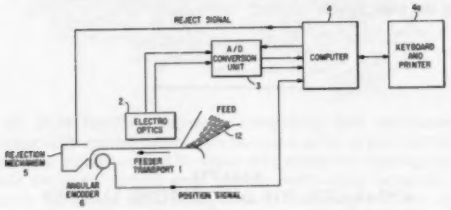
means positioned a spaced distance forwardly from the leading edges of the bars for receiving the first group of material from the bars; and

means positioned adjacent the separating zone a distance below the tips of said parallel bars for receiving the second group of material, whereby a first portion of the second group of material is conveyed on the trough and separated from the first group by falling over the trough edge in the separating zone, and whereby a second portion of the second group of material conveyed in a potentially jammed position on the bars is separated from the first group by falling between the leading edges of the bars and the first group receiving means.

4,143,770
METHOD AND APPARATUS FOR COLOR RECOGNITION AND DEFECT DETECTION OF OBJECTS SUCH AS CAPSULES

William C. Grimmell, Lake Hiawatha, N.J.; Jim M. Adams, Holtzminden, Fed. Rep. of Germany; Gilbert C. Kaetzel, Wayne, N.J.; Robert P. Fazzini, Nutley, N.J., and Edward F. DeZabala, Pequannock, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jun. 23, 1976, Ser. No. 698,986
Int. Cl.² B07C 5/344
U.S. Cl. 209—558 87 Claims



1. Apparatus for the automated surface analysis of single- and multi-colored objects such as pharmaceutical dose forms based on a standard representative of desired color(s) and a time varying shape signature standard, and for classifying the objects as acceptable or non-acceptable comprising:

(a) first means including electro-optic means for receiving electromagnetic radiation from an object and for converting same into corresponding electrical signals including signals constituting at least one color vector of the object and signals constituting the time-varying shape signature of the object, and further including means for effecting relative translational movement between said electro-optic means and the objects and for providing output signals which are utilized in determining the instantaneous relative location of the object;

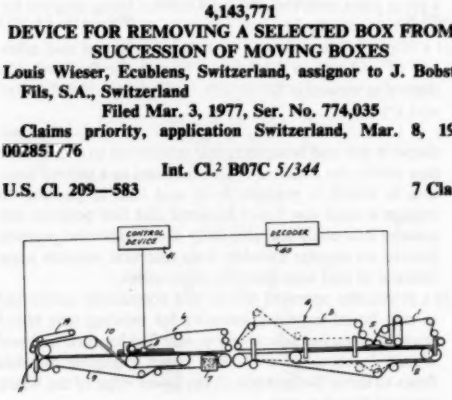
(b) second means for storing a standard signal representative of the desired object color and a standard time-varying signal representative of the desired object shape; and

(c) third means operatively connected to said first and second means for comparing the derived signals of the object with the stored standard signals and determining therefrom the acceptability/non-acceptability of that object.

4,143,771
DEVICE FOR REMOVING A SELECTED BOX FROM A SUCCESSION OF MOVING BOXES

Louis Wieser, Ecublens, Switzerland, assignor to J. Bobst & Fils, S.A., Switzerland

Filed Mar. 3, 1977, Ser. No. 774,035
Claims priority, application Switzerland, Mar. 8, 1976, 002851/76
Int. Cl.² B07C 5/344
U.S. Cl. 209—583 7 Claims

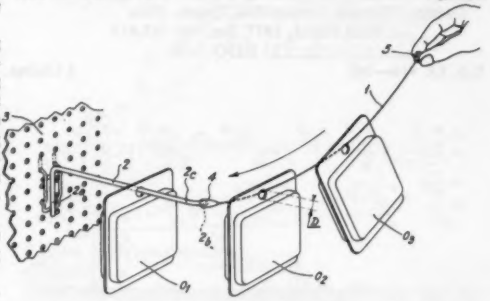


1. An apparatus for withdrawing a selected, folded box from a flow of folded boxes traveling in a plane of a device having means for conveying the folded boxes in said plane, said apparatus comprising means for detecting the selected box, means for selectively deflecting the selected box from the plane of the flow of folded boxes, said means for deflecting being disposed adjacent a discharge of the means for conveying, and including means for moving the deflecting means vertically with respect to the plane of the flow of folded boxes between a position withdrawn from the flow of folded boxes to a deflecting position in response to a signal from the means for detecting, and means for ensuring a positive conveyance of a selected box deflected from the plane of the flow, said means for ensuring the positive conveyance being disposed adjacent said discharge so that a box selected by the means for detecting is deflected from the plane of the flow of folded boxes and is positively conveyed away from said deflecting means and the flow of folded boxes.

4,143,772
METHOD OF, AND DEVICE FOR, RAPIDLY THREADING PERFORATED ARTICLES ONTO A ROD, IN PARTICULAR A ROD OF A DISPLAY UNIT

Edmond Bona, Beton Bazoches, France, assignor to Droguet International, Paris, France

Filed Nov. 23, 1977, Ser. No. 854,373
Claims priority, application France, Nov. 26, 1976, 76 35686
Int. Cl.² A47F 7/00
U.S. Cl. 211—59.1 4 Claims



1. A device for threading perforated articles onto a rod fixed at a first end, the device comprising an elongate support and a tubular coupling fixed to a first end of said support, said tubular coupling being dimensioned internally to receive the second, free end of the rod and being dimensioned externally so that it can pass through the perforations in said articles, in which the elongate support is a flexible cord.

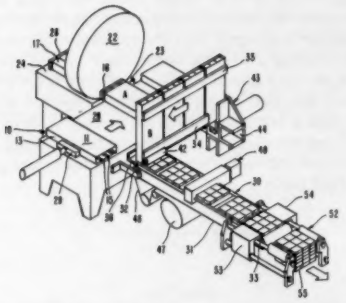
4,143,773
APPARATUS FOR ASSEMBLING ITEMS

Wayne F. Everman, Cedar Falls, Iowa, and Vincent E. Bernard, Richardson, Tex., assignors to Swift & Company, Chicago, Ill.

Division of Ser. No. 653,918, Jan. 30, 1976, Pat. No. 4,051,753.
This application Feb. 3, 1977, Ser. No. 765,082
Int. Cl.² B65G 47/26
U.S. Cl. 414—787 2 Claims

1. An apparatus for laterally separating columns of discrete articles of product that are moved in a given direction which columns of product are initially in side-to-side contact, said apparatus comprising: moving means disposed to advance said columns of product in said direction; plural runways aligned in said direction with said columns so as to receive said product from said moving means; and dividers between said runways, said runways first diverging vertically with respect to one another so as to vertically displace said articles in said columns of product and then converging to a single level whereby all

corresponding points between the entry and exit portions of adjacent runways will be spaced vertically one from the other,



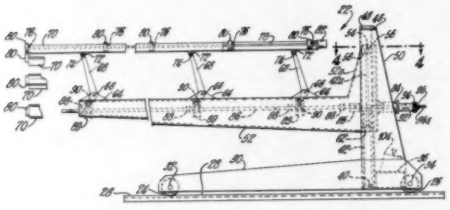
said dividers being positioned to urge adjacent articles in said columns of product apart laterally while vertically displaced.

4,143,774

TRUCK FOR INTERNALLY SUPPORTING AND TRANSPORTING PLASTIC PIPE FROM A PIPE MAKING MACHINE

Peder U. Poulsen, Fredensborg, Denmark, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Feb. 4, 1977, Ser. No. 765,473
Int. Cl.[2] B23Q *1/08*
U.S. Cl. 414—745 **2 Claims**



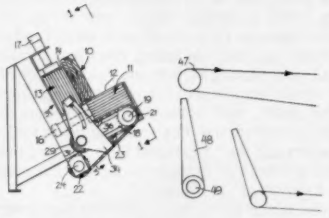
1. For receiving and supporting glass fiber reinforced thermosetting resin pipe being continuously produced by a pipe making machine and for transporting cut-off pipe segments away from the machine along a pair of floor-mounted rails extending parallel to and disposed on opposite sides equal distances from the longitudinal axis of pipe being formed, a truck comprising a pair of spaced elongated generally parallel side frame members each having a front wheel and a rear wheel rotatably mounted thereon, the wheels of each side frame member normally being mounted on a respective one of said rails, an upstanding framework connecting said side frame members together solely adjacent rear end portions thereof, a horizontally extending elongated main beam supported solely adjacent one end on said framework and extending forwardly therefrom with the longitudinal axis lying in a vertical plane which is between and parallel to said side frame members, several elongated auxiliary beams parallel to said main beam and arranged in a semicircular pattern thereabout above and on opposite sides thereof, each of said auxiliary beams having a set of several rollers mounted thereon for rotation about a common axis parallel to the beam, the rollers being spaced from each other longitudinally of the beam and projecting outwardly therefrom for engagement with the inside of a pipe segment, the auxiliary beams with their rollers being adapted to support a pipe segment by engagement with the inside of the pipe segement substantially only on an upper half thereof, several sets of parallel levers of equal length, there being several levers in each set and the levers of each set being spaced from each other longitudinally of the beams, each of said auxiliary beams being connected to the main beam by one of said sets of parallel levers, each of said levers having a fulcrum on said main beam, being pivotally connected adjacent an outer end on one side of its fulcrum to its respective auxiliary beam, and having an inner end portion on the other side of its fulcrum, an axially reciprocable horizontal actuating shaft operatively connected to the inner end portions of all of said levers for expanding and contracting the auxiliary beams radially with respect to the main beam, means on said main beam operatively connected to said horizontal actuating shaft for axially reciprocating the shaft, and means on said framework operatively connected to said main beam for vertically adjusting the main beam.

4,143,775

APPARATUS FOR DISPATCHING LUMBER

Dean W. Shields, Birmingham, Ala., assignor to The Filer and Stowell Company, Milwaukee, Wis.

Filed Mar. 28, 1977, Ser. No. 781,978
Int. Cl.[2] B65G *47/90*
U.S. Cl. 414—330 **4 Claims**



3. Apparatus for dispatching boards of lumber from a package of sawn boards comprising:

(a) means delivering packages of sawn boards lengthwise sequentially to a first position,

(b) at least one arm pivotally supported adjacent one end at a pivot point with the other end thereof being adapted for rotation around said pivot point,

(c) a dispatch pan mounted for rotation adjacent said other end of said arm and having a face at the forward side thereof as viewed in the direction of rotation of said end of said arm,

(d) at least one board engaging member carried by said dispatch pan and being movable selectively to a first location within the confines of said face and to a second location in which it projects from said face in position to engage at least one board adjacent said first position and transfer it laterally and angularly to a preselected position located on angular distance from said first position upon rotation of said arm about its pivot point,

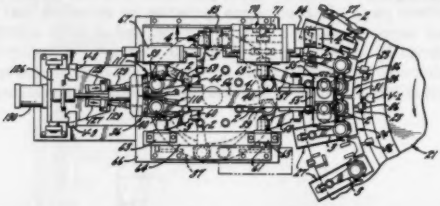
(e) a pneumatic operated power unit operatively connected to said board engaging member for moving said board engaging member selectively to said first location and said second location whereby said board engaging member floats to sense the location of the lower edge of the board engaged thereby, and

(f) means to rotate said arm about its pivot point to move said dispatch pan from said first position to preselected positions and subsequently around to said first position to start another cycle of operation without recrossing the path of movement of said boards to said first position.

4,143,776
APPARATUS FOR TRANSFERRING AND TURNING OVER PARTS

Richard H. Meyers, and Dennis L. White, both of Rockford, Ill., assignors to Mattison Machine Works, Rockford, Ill.

Filed Jul. 18, 1977, Ser. No. 816,435
Int. Cl.[2] B65G *47/90*
U.S. Cl. 414—735 **19 Claims**

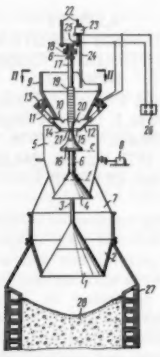


13. Parts handling apparatus comprising first and second horizontally spaced tables each having a series of part carriers spaced angularly around its upper side, means for rotating each table about an upright axis, transfer mechanism mounted to shuttle back and forth along a path extending between the tables, said transfer mechanism being operable to pick up a first part from a first one of said carriers on said first table and to release said first part to a first one of said carriers on said second table, said transfer mechanism also being operable to pick up a second part from a second one of said carriers on said second table and to release said second part to a second one of said carriers on said first table, said transfer mechanism releasing one part at about the same time the transfer mechanism picks up another part, turn over mechanism located adjacent said second table, said turn over mechanism being operable to pick up a part placed on said second table by said transfer mechanism, re-orient such part and then replace the re-oriented part on said second table whereby the re-oriented part may be subsequently picked up by said transfer mechanism and returned to said first table.

4,143,777
BLAST FURNACE CHARGING DEVICE

Nikolai S. Nemtsov; Viktor I. Vasiliev; Vladimir P. Tarasov; Stanislav T. Pliskanovsky; Anatoly A. Shokul; Anatoly P. Kravchenko; Fedor V. Kraizinger, and Ivan I. Krjukov, all of Zhdanov Donetskoi oblasti, U.S.S.R., assignors to Zhdanovsky Metallurgichesky Institut, Zhdanov, U.S.S.R.

Filed Oct. 6, 1977, Ser. No. 838,721
Int. Cl.[2] F27B *11/12*
U.S. Cl. 414—170 **9 Claims**

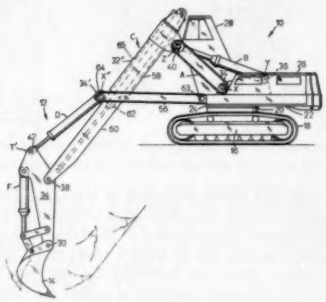


1. A charging device for a blast furnace comprised of a receiving hopper having an outlet therein, at least one rod disposed along the longitudinal axis of said hopper and extending through said outlet, a plurality of coupling rods disposed above said rod to support said rod, a plurality of guard rings disposed on said rod, at least one of said rings having a funnel-shaped outer surface and being disposed at the location of said outlet of said hopper, means for adjusting the cross-sectional area and shape of said outlet including a plurality of sector shields, a plurality of guideways slidably engaging said sector shield, said sector shields being disposed about said tapered guard ring defining a funnel shaped annular opening thereabout and being adjustable in size, means for laterally displacing each said shield such that lateral displacement of each shield along said guideways changes the size and shape of said hopper outlet.

4,143,778
SHOVEL ATTACHMENT MEANS FOR HYDRAULIC EXCAVATOR

Karl H. Ullmann, Dortmund, Fed. Rep. of Germany, assignor to Harnischfeger Corporation, Milwaukee, Wis.

Division of Ser. No. 803,356, Jun. 3, 1977, Pat. No. 4,103,791.
This application Apr. 19, 1978, Ser. No. 897,715
Int. Cl.[2] E02F *3/30*
U.S. Cl. 414—694 **4 Claims**



1. In an excavating machine:
a frame;
shovel attachment means mounted on said frame near the working end of said machine; and
a shovel mounted on said shovel attachment means; said shovel attachment means comprising:
a stroke arm having an upper end and a lower end;
first means for pivotally connecting said lower end of said stroke arm to a first point on said frame;
an extendable and retractable stroke arm cylinder having an upper end and a lower end for pivotally moving said stroke arm about said first point;
second means for pivotally connecting said lower end of said stroke arm cylinder to a second point on said frame;
third means for pivotally connecting said upper end of said stroke arm and said upper end of said stroke arm cylinder to a common point;
a shovel arm assembly having an upper end and a lower end;
said shovel arm assembly comprising a first beam section connected to said common point, a second beam section, means for pivotally connecting said second beam section to said first beam section; and wherein said shovel is connected to said second beam section;
fourth means for connecting said upper end of said shovel arm assembly to said common point;
an extendable and retractable shovel arm cylinder having an inner end and an outer end for pivotally moving said shovel arm assembly about said common point;
fifth means for indirectly pivotally connecting said inner end of said shovel arm cylinder to said frame;
sixth means for pivotally connecting said outer end of said shovel arm cylinder to a point on said shovel arm assem-

bly spaced from said common point and near the upper end of said second beam section;

and means for connecting said shovel to said lower end of said shovel arm assembly.

4,143,779

CAN END FEEDER

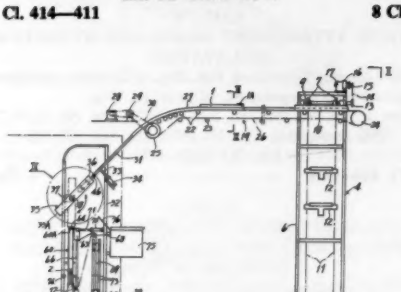
Kazumitsu Hachikawa, and Masaaki Ogawa, both of Kawaramachi, Japan, assignors to Hitachi Shipbuilding & Engineering Co. Ltd., Osaka, Japan

Filed Oct. 3, 1977, Ser. No. 838,586

Claims priority, application Japan, Oct. 5, 1976, 51/120067

Int. Cl.[2] B65G *65/40*

U.S. Cl. 414—411 **8 Claims**



1. A can end feeder including at least one conveyor means for feeding one by one bags each containing a stack of can ends, de-bagger means having at least one de-bagger case and bag opening means, the de-bagger case being turnable between a receiving position for receiving the bag from the conveyor means and a discharge position in which the case has its opening directed downward to render the can ends within the bag downwardly movable by gravity, and guide means for guiding the can ends to a seamer when the can ends fall from the bag within the case, the improvement comprising:

the bags each having an open end closed by being folded and feedable with the folded portion positioned in the rear with respect to the direction of travel of the bags,

the case having an inside diameter greater than the outside diameter of the bag by an amount permitting the bag to be smoothly placed therein,

the case being provided with suction means for at least partially adhering the bag therein to its inner wall, and

the case being provided with means for discharging the bag therefrom.

4,143,780

LIFTING DEVICE FOR FEEDING A PROCESSING MACHINE

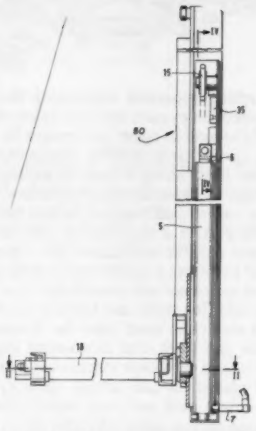
Karl Schnell, Mühlstr. 28, D-7065 Winterbach, Fed. Rep. of Germany

Filed Mar. 11, 1977, Ser. No. 776,871

Int. Cl.[2] B65G *65/04*

U.S. Cl. 414—620 **7 Claims**

1. A lifting device for feeding a processing machine, particularly for the food industry, comprising a telescopic post including at least one bottom part and one upper part movable telescopically upwardly and downwardly in respect to said bottom part, a container support having at least one bottom support member adapted to extend generally horizontally to support a container when in a support position, means pivotally supporting said support on said telescopic post permitting the pivoting of said support to a support position with said bottom support member disposed horizontally and to a discharge position with said bottom support member disposed at a tilting angle in respect to the horizontal for the discharge of the container thereoff, cam means defined between said support and said post for causing the pivoting of said support during the telescopic movement of said at least one bottom part and said at least one upper part so as to shift said support between said support position and said discharge position which is beyond a dead center position of said support and means for moving said at least one upper part relative to said at least one bottom part, said cam means including an extension part on said support having a groove therein, and a guide member carried by said post engageable with said groove during the telescopic movement of said at least one upper part relative to said at least one bottom part, said groove extending at an angle



obliquely relative to said bottom support member of said support, said angle being from 90° to 120°, return spring means disposed in the path of movement of said support so as to be contacted by said support when said support moves beyond said dead center position and to become tensioned by further movement of said support for returning said support to a returned position after said means for raising said one upper part relative to said one bottom part becomes no longer effective and a bolt extending through said spring, said spring comprising a helical compression spring concentrically surrounding said bolt and resting at its lower end against the upper part, said bolt having a collar engaged against the opposite end of said spring.

4,143,781

HOISTING MECHANISM FOR STRADDLE CARRIER SPREADER AND STRADDLE CARRIER STEERING SYSTEM

Norbert W. Lenius, and Richard A. Stearn, both of Sturgeon Bay, Wis., assignors to J. I. Case Company, Racine, Wis.

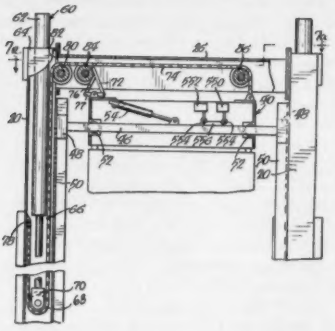
Division of Ser. No. 729,402, Oct. 4, 1976. This application Oct. 25, 1977, Ser. No. 844,654

Int. Cl.[2] B60P *3/00*

U.S. Cl. 414—460 **9 Claims**

1. In a vehicle having an inverted U-shaped frame having an upper horizontal portion and a pair of spaced legs defining an elongated container carrying bay with a spreader supported for vertical movement in said bay and first and second hoist means respectively connected to opposite ends of said spreader, the improvemnt of each of said hoist means comprising a vertically extending fluid ram having a first element connected to said frame and a second element supported for movement on said first element with a first pulley rotatably supported on a free end of said second element, three elongated flexible members extending parallel to each other and entrained over said first pulley with one end of each flexible member connected to said frame adjacent said fluid ram, a

second pulley on said horizontal portion of said frame above one end corner of said spreader with an intermediate flexible member of said three elongated flexible members entrained over said second pulley and a third pulley on said horizontal portion of said frame above an adjacent corner of said spreader



with both outer of said flexible members entrained over said third pulley and connected to said adjacent corner so that any load supported on said spreader is distributed equally across said first pulley regardless of the unequal distribution of load at the two adjacent corners of said spreader.

4,143,782

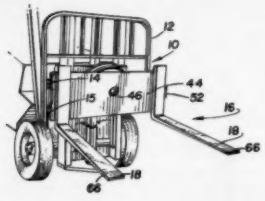
ROTARY DEVICE FOR FORK-LIFT TRUCKS

Paul E. Dengler, 10946 Kane Ave., Whittier, Calif. 90604

Filed Sep. 12, 1977, Ser. No. 832,659

Int. Cl.[2] B66F *9/19*

U.S. Cl. 414—672 **1 Claim**



1. A rotary device adapted for use in combination with a fork-lift truck, wherein the device comprises:

a rear-support plate mountably secured to the lifting structure of said fork lift, and having a pair of hook members formed thereon and positioned to engage the lifting structure of said fork lift;

a bearing spindle secured to said rear-support plate and including:

a base plate suitably affixed to said rear-support plate;

a spindle member mounted to said base plate and extending outwardly therefrom;

a hub member rotatably supported on said spindle having an enlarged annular flange member;

bearing means interposed between said spindle and said hub member;

a fork-mounting plate attached to said annular flange member of said bearing spindle so as to rotate about the central axis of said bearing spindle;

a locking drum mounted to said hub member and disposed between said annular flange and said rear support plate, whereby said drum rotates with said hub member, said drum having a locking slot disposed therein;

latching means operably affixed to said rear support plate and arranged to releasably engage said slot of said drum;

a pair of oppositely disposed fork-lift members removably mounted to said fork-mounting plate; and

a pair of stop tabs attached to each end of said fork mounting plate to prevent lateral movement of said fork-lift members as said fork-lift members rotate about the central axis of said spindle.

4,143,783

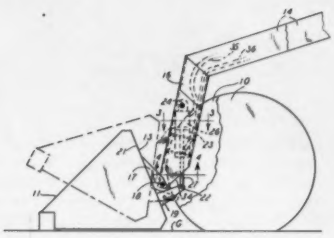
REVERSE LINKAGE LOADER BUCKET ARM WITH ENCLOSED CYLINDER

Gary L. Cochran, and Charles D. Wilson, both of Burlington, Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed Dec. 14, 1977, Ser. No. 860,150

Int. Cl.[2] E02F *3/74*

U.S. Cl. 414—715 **4 Claims**



1. A reverse linkage loader bucket arm with an enclosed cylinder, comprising a loader bucket having an open front and a closed rear portion in a horizontal orientation for being loaded, an arm extending to a terminal end adjacent said loader bucket rear portion, said bucket being pivotally mounted on said arm terminal end at a location on said rear portion, said arm being axially hollow along said terminal end and being of an endless girth transverse to the axis thereof and terminating in an open end, said arm open end being defined by an edge of said arm surrounding said open end at said terminal end and defining said open end, said edge lying on a plane oblique to the longitudinal axis of said terminal end, for accommodating the pivotal movement of said bucket on said arm, and a cylinder assembly disposed within said hollow terminal end and being pivotally connected to said arm and to said bucket rear portion at a location spaced at an elevation lower than the location of the pivot connection between said bucket and said arm.

4,143,784

WATER BOTTLE AND ITS STORAGE CASE

Carl E. Frahm, and Shirley E. Frahm, both of 1428 Oak Meadow Rd., Arcadia, Calif. 91006

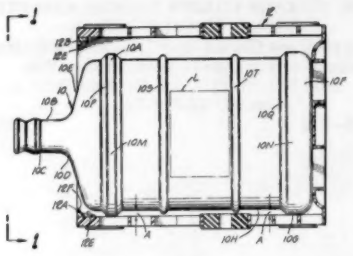
Continuation of Ser. No. 605,462, Aug. 18, 1975, abandoned. This application Jul. 7, 1977, Ser. No. 813,506

Int. Cl.[2] B65D *11/16*

U.S. Cl. 215—12 R **1 Claim**

1. In combination a bottle of approximately five gallon capacity, a case for the bottle having an abutment, said bottle having a raised bead engageable with said abutment and over which said bottle is required to be raised for removal of the bottle from said case, said bead and abutment being normally engageable to prevent inadvertent or accidental removal of the bottle from the case, said bead and said abutment having approximately the same height, said bottle having a cylindrical neck portion of sufficient length such that approximately four fingers of a person's hand may encircle the same for raising the bottle above said abutment for removal of said bottle and for convenient handling of the bottle after removal of the bottle from its case, said bead extending circumferentially of the bottle, said bead having an external diameter somewhat less than the spacing between a plurality of abutments on the case each of which is engageable, depending upon the position of

said case, with said bead, said bead having an outer cylindrical portion contiguous with an inner tapered portion, said tapered portion being engageable in initial movement of the bottle from said case, with an inner tapered portion of said abutment, said bottle having a bulbous base portion which has an external diameter substantially equal to the external diameter of said raised bead, said bottle including two spaced beads between said bead and said bulbous base portion, said two spaced beads



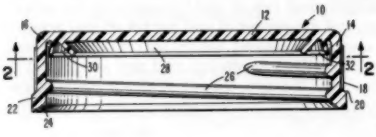
defining a space therebetween for attachment of a label which is protected against scuffing during insertion and removal of the bottle from its case, said spaced beads are of equal external diameter which is less than the external diameter of said bead and said bulbous base portion, said bead and said bulbous base portion being the sole means on said bottle which contacts said case when said bottle is within said case, with said abutment being the sole means which prevents slippage of the bottle out of the case.

4,143,785

PLASTIC VACUUM SEALING CAP

Joseph C. Ferrell, Bradenton, Fla., assignor to Sun Coast Plastic Closures, Inc., Bradenton, Fla.

Filed Mar. 16, 1978, Ser. No. 887,263
Int. Cl.[2] B65D *53/00*
U.S. Cl. 215—270 **4 Claims**



1. A resealable plastic cap for vacuum sealing of containers, comprising:

a top wall to extend over and to cover the mouth of a container to which the cap is to be applied;

an annular side wall integrally formed with and depending from the perimeter of said top wall;

a first annular flange integral with and depending from said top wall, said first flange having substantially parallel inner and outer surfaces and being angled downwardly toward the axis of said cap to form an angle of substantially 45° with the plane of said top wall, said first flange being of sufficient length and extending sufficiently far below the plane of said top wall that the outer surface thereof will engage the inner rim edge of a container wall, the angle of said first flange providing a linear contact with the rim edge;

a second annular flange integral with and depending from said top wall, said second flange being independent of, concentric with and spaced outwardly from said first flange and being concentric with and spaced inwardly from said annular side wall by a distance sufficient to prevent contact with said side wall when said cap has been applied to a container, said second flange further having substantially parallel inner and outer surfaces, being angled downwardly away from the axis of said cap and forming an angle of substantially 80° with the plane of said top wall, and being of sufficient length and extending sufficiently far below the plane of said top wall that the inner surface of said second flange will engage the outer rim edge of a container wall, the angle of said second flange providing a linear contact with the rim edge;

said first and second flanges each having a base portion at its intersection with said top wall, the bases of said first and second flanges being spaced apart a distance sufficient to insure flange contact with the inner and outer rim edges only of the container to which the cap is to be applied, the distance between the bases being less than the wall thickness of such a container; and

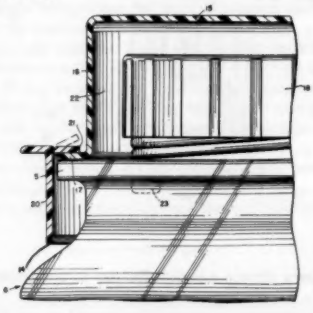
said first and second flanges being sufficiently flexible to permit the flanges to conform to variations in, and to provide continuous sealing contact with, the peripheral inner and outer rim edges of containers and being so spaced and angled with respect to each other and a container wall as to define a pocket when said cap is applied to a container, said flanges cooperating with the rim edges of the container wall to provide a vacuum seal for containers having varying wall thicknesses, saddle defects, chips and other anomolies, and further cooperating to produce a suction effect in the pocket to permit use of the cap to reseal such containers.

4,143,786

ADDITIVE CAP AND SNAP-ON RETENTION RING FOR MEDICAL LIQUID CONTAINER

Allan M. Goldberg, Laguna Niguel, and Douglas J. Malewicki, Irvine, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Feb. 21, 1978, Ser. No. 879,297
Int. Cl.[2] B65D *45/30*
U.S. Cl. 215—274 **8 Claims**



1. A container with an outlet sealed by a closure wherein the improvement comprises: an additive cap having an external flange fitting over the closure and spaced a sufficient distance from the closure for axial separation of the additive cap and closure; and a snap-on retention ring having a plurality of flexible lugs overlying the additive cap flange and releasably securing the additive cap to the container.

4,143,787

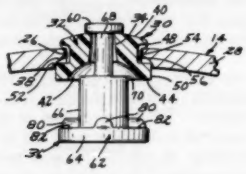
CAPTIVATED OVER-PRESSURE RELIEF AIR VENT ASSEMBLY

Duane H. Walker, Fall Creek, Wis., assignor to National Presto Industries, Inc., Eau Claire, Wis.

Filed Jun. 15, 1978, Ser. No. 915,823
Int. Cl.[2] B65D *51/16*
U.S. Cl. 220—203 **15 Claims**

14. In combination, a pressure cooker having a wall, a vent pipe fixed in said wall, having a pressurizing regulator

mounted thereon to maintain the cooker at a set cooking pressure and an over-pressure plug fixed within an opening in said wall so as to be ejected therefrom by pressure developed in the cooker which exceeds that for which the regulator is set, said over pressure plug containing an aperture and a plunger including a stem extending through said aperture having an outer head which overlies the outer side of the over-pressure plug and an inner head having a shoulder portion to engage the underside of the plug about the aperture, said outer head and shoulder portion being spaced apart a distance greater than the



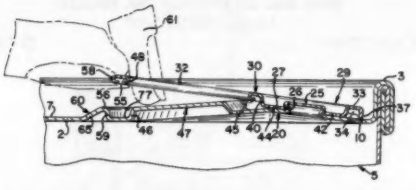
axial length of the aperture, said plunger reacting to pressure developed in the cooker to lift the outer head off the plug when the cooker is in a pressurized state, and the inner head of the plunger having spaced abutment portions which engage the underside of the cooker wall about the opening when the overpressure plug is ejected from the opening so as to retain the plug and its plunger captivated by the cooker, said inner head providing exits between the abutments for fluids to escape from the cooker through the vacated opening to reduce the developing pressure in the cooker.

4,143,788

CHILD RESISTANT SAFETY CLOSURE

John J. Rosynek, Dolton, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Aug. 15, 1977, Ser. No. 824,473
Int. Cl.² B65D *41/32*
U.S. Cl. 220—273 **10 Claims**



1. A pull-out closure for a can or similar container having an end panel with a tear score therein defining a tear flap adapted to be torn outwardly from said end panel and folded about a transverse hinge score in the end panel to form a pour opening, tab means connected to said flap for breaking the tear score and pulling the flap outwardly, and preprogramed bendable means for yieldably resisting folding of said flap about said hinge score.

4,143,789

RETAINER FOR RELEASABLE SECUREMENT OF DRUMS AND SEALING CAPS

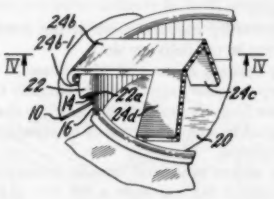
Don W. Wade, Orinda, Calif., assignor to Rheem Manufacturing Company, New York, N.Y.

Filed Apr. 26, 1978, Ser. No. 900,075
Int. Cl.² B65D *45/28*
U.S. Cl. 220—323 **9 Claims**

1. A retainer for releasable securement of a container, having a neck defining a container opening, and a closure member seated in said opening, comprising:

(a) first means engageable with said neck for restraining both said closure member and said retainer from movement axially of said neck; and

(b) second means connected to said first means and engageable with the outer surface of said closure member for restraining said retainer from movement transversely of said neck for transverse forces of one sense and of the opposite sense applied to said retainer.



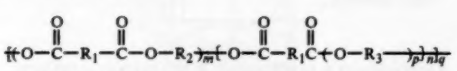
4,143,790

COATED METAL STRUCTURE AND PROCESS FOR PRODUCTION THEREOF

Hiroshi Ueno, Yokosuka; Michiko Tsurumaru, Tokyo; Shinya Otsuka, Yokohama; Hiroshi Matsubayashi, Kamakura; Masanori Aizawa, Yokohama; Hiroki Sano, Yokosuka, and Yukio Suzuki, Kawasaki, all of Japan, assignors to Toray Industries, Inc. and Toyo Seikan Kaisha Ltd., both of Tokyo, Japan

Filed Nov. 22, 1976, Ser. No. 743,662
Claims priority, application Japan, Nov. 26, 1975, 50-140792
Int. Cl.² B65D *25/14*
U.S. Cl. 220—458 **11 Claims**

1. A metal can formed from a coated metal structure wherein said coated metal structure consists essentially of a metal substrate and only a single overcoat layer composed primarily of a thermoplastic polyester resin which is heat-bonded directly to the surface of said metal substrate, said polyester resin being composed of recurring units represented by the following formula:



wherein R_1 stands for a divalent hydrocarbon group, at least 45 mole % of which is a p-phenylene group, each of R_2 and R_3 stands for a divalent aliphatic hydrocarbon group, at least 45 mole % of which is a tetramethylene group, p and q each stands for a number equal to at least 1, and m and n each selectively stands for 0 or a number equal to at least 1 with the proviso that when one of m and n is 0 the other of m and n must be a number equal to at least 1, and having a relative viscosity of 1.2 to 1.8 as measured at 25° C. in o-chlorophenol at a concentration of 0.5 g/100 ml, and the tack point of said polyester resin being not lower than 130° C. and the degree of crystallinity of said polyester resin being up to 30%.

4,143,791

APPARATUS FOR DELIVERING NEWSPAPERS, MAGAZINES AND SIMILAR ARTICLES

Henri P. Bienfait, 29 Insulindeweg, Delft, Netherlands

Filed Jul. 19, 1977, Ser. No. 817,067
Claims priority, application Netherlands, Dec. 8, 1976, 7613637
Int. Cl.² B65H *1/14*
U.S. Cl. 221—75 **1 Claim**

1. In apparatus for delivering newspapers, magazines and similar articles, which are delivered one at a time therefrom when a purchaser has inserted the required coin or coins, having a substantially closed rectangular case for holding a

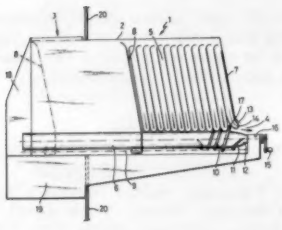
row of newspapers, a delivery slot, and screw means operative, after insertion of the coin as required, to move a newspaper towards the delivery slot to thereby enable a purchaser to withdraw the newspaper from the case, wherein the improvement comprises:

(1) a downwardly inclined plate at the front of the case terminating in the delivery slot;

(2) a filling opening at the rear of the case;

(3) a conveyor screw extending substantially the full length of the case from the rear to a point below the delivery slot and adapted to support a row of newspapers standing on their backfolds;

(4) biasing means advanced by the conveyor screw and bearing against the rear most in the row of newspapers to



keep the papers upright and force the foremost paper towards the delivery slot;

(5) the front plate at its lower edge forming one side of the delivery slot being formed with an outwardly rounded lower edge; and

(6) the conveyor screw is formed with a helical groove engaging the backfold of the newspapers and the leading end of the conveyor screw is tapered, the arrangement being such that the leading newspaper is delivered with its backfold being pushed out through the delivery slot so that it can be easily grasped and withdrawn from the case, and the depth of the helical groove being such to prevent removal of any further paper for which coins have not been inserted.

4,143,792

AUTOMOBILE WINDSHIELD WASHING SERVICE UNIT

Roger F. Rex, Hales Corners, Wis., assignor to Display Corporation International, Milwaukee, Wis.

Filed Sep. 9, 1977, Ser. No. 831,889

Int. Cl.[2] A47L *13/56*; B65D *25/24, 25/00*; A47L *1/06*

U.S. Cl. 221—97 **14 Claims**

12. A device for holding automobile windshield washing apparatus comprising:

a bin having an open upper end, a lower closed end spaced from said open end;

said bin being defined by a front panel extending from said open end to a bottom panel and said bottom panel defining said lower closed end;

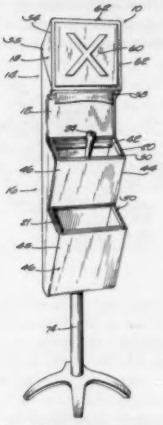
a back panel opposite to and spaced from said front panel and being tapered inwardly toward said front panel adjacent said bottom panel;

body means including upper and lower portions, a back panel, and further including means for defining a plurality of pockets generally stacked one above the other in said lower portion;

a plurality of said bins corresponding in number with the number of said pockets and one of said bins being removably supported in a generally upright position in each of said pockets;

towel dispensing means attached to said upper portion, said towel dispensing means including an interior portion for receiving paper towels, a lid portion hingedly attached to said body means for access to and to cover said interior; and

mounting means for said body means comprising means defining a plurality of generally inverted U-shaped recesses located in said back panel, and a plurality of mounting



brackets corresponding in number with said recesses, said brackets having a shape corresponding to the shape of said recess and receivable in said recesses so that with said brackets fixed said body hangs on said bracket but is removable therefrom by lifting upwards.

4,143,793

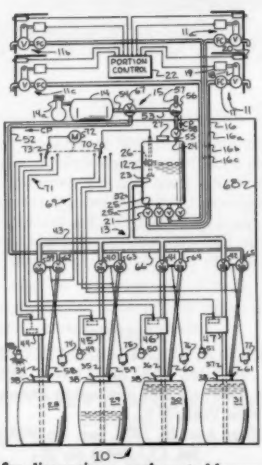
APPARATUS AND METHOD FOR DISPENSING A CARBONATED BEVERAGE

John R. McMillin, Maplewood, Minn., and Peter Strandwitz, Neenah, Wis., assignors to The Cornelius Company, Minneapolis, Minn.

Filed Jun. 13, 1977, Ser. No. 806,136

Int. Cl.[2] B67D *5/08*

U.S. Cl. 222—1 **25 Claims**



1. Apparatus for dispensing a carbonated beverage comprising:

(a) a source of compressed air;

(b) a reservoir for holding therein a quantity of beverage to be dispensed;

(c) a beverage supply conduit having a downstream end fluidly connected to said reservoir, and an upstream end adapted to be fluidly connected to a supply vessel having carbonated beverage therein;

(d) a compressed air supply conduit having

(1) a supply vessel branch line having an upstream end connected to said source of compressed air, and a downstream end adapted to be fluidly connected to said supply vessel for pressurizing beverage within the vessel with compressed air,

(2) a reservoir branch line having an upstream end connected to said source of compressed air, and a downstream end fluidly connected to said reservoir for pressurizing beverage within the reservoir with compressed air, and

(3) means for regulating air pressure in the reservoir at a lower level of pressure than an air pressure in the supply vessel and at least equal to the carbonation saturation pressure of the beverage within the reservoir;

(e) a dispensing conduit having an upstream end fluidly connected to the reservoir, and a downstream end having thereon means for controlling dispensing of beverage withdrawn from said reservoir and through said dispensing conduit; and

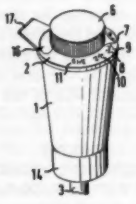
(f) a normally closed beverage supply valve in said beverage supply conduit for normally precluding flow of beverage from said supply vessel to said reservoir, said beverage supply valve being selectively openable for permitting flow of beverage from the supply vessel to the reservoir.

4,143,794

FLUID DISPENSING DEVICE

Michael G. Stratford, Tring, England, and Ronald H. D. F. Lee, deceased, late of Berkhamsted, England (by Angel J. Lee, executor), assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Jul. 28, 1977, Ser. No. 819,865
Int. Cl.[2] B67D 5/22; B65G 59/00
U.S. Cl. 222—42 **8 Claims**



1. A dosing device for fluids which comprises a dosage up a dip tube having an extension situtated within the dosage cup, the extension being constructed to enable fluid to pass from within said extension into the dosage cup, and dose determining means slidably engaging a side wall of the extension and movable relative to the extension between positions enabling retention within said cup of a selected dosage volume of fluid and return of any excess fluid into said extension.

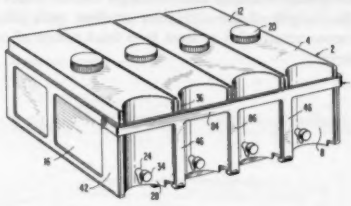
4,143,795

REFRIGERATOR BEVERAGE DISPENSERS

John P. Casebier, 1204 11th Ave., Vero Beach, Fla. 32960

Filed Jun. 24, 1977, Ser. No. 809,535
Int. Cl.[2] B67D 5/60
U.S. Cl. 222—143 **9 Claims**

1. A refrigerator beverage dispenser comprising a plurality of substantially equal size containers having a concave front and substantially flat back, top, bottom and parallel sides, the length of said sides being greater than the width of said front and back, a rack comprising a base, parallel sides and back and a gate carried on said base at the front of said rack, latch means to fasten said gate in a closed position to enclose said containers in said rack, said rack base comprising parallel longitudinal ribs that exceed in number by one the number of said containers and at least three parallel transverse ribs, said longitudinal ribs being spaced apart from each other approximately the width of said containers and have recesses in their upper surfaces into which a portion of said containers extend when the containers



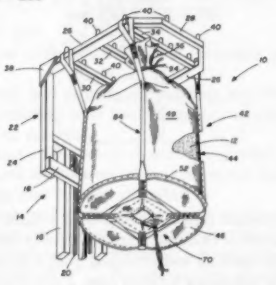
are positioned in said rack, a spout fixed on the front of each said container at the base thereof through which liquid in the container may flow on demand, a filler opening in the top of each container and a removable cap closing each said opening, said containers being held in said rack so that the bottoms thereof slope downwardly toward the front of said rack.

4,143,796

COLLAPSIBLE RECEPTACLE FOR FLOWABLE MATERIALS

Robert R. Williamson, and Norwin C. Derby, both of Dallas, Tex., assignors to Super Sack Manufacturing Corporation, Dallas, Tex.

Filed Jul. 7, 1977, Ser. No. 813,634
Int. Cl.[2] B65D 29/02
U.S. Cl. 222—185 **19 Claims**



1. A collapsible receptacle for handling flowable materials, comprising:

a substantially flexible container having upper and lower ends and defining a generally cylindrical collapsible chamber for the flowable materials;

said container including a substantially cylindrical side wall comprised of a plurality of substantially rectangular panels each having a top edge, a bottom edge, and two side edges;

said side wall panels being circularly arranged with adjacent side edges folded outwardly, and secured together inwardly of the side edges thereof to form a plurality of outwardly facing and longitudinally extending container side wall seams;

the upper end of said container comprising a selectively closable fill opening;

means for selectively closing the fill opening; and

a flexible and substantially inextensible sling assembly for supporting the container, said sling assembly having a plurality of lift straps extending upwardly in circumferentially spaced relationship with the top ends of the straps

terminating a predetermined distance beyond the upper end of the container;

a lift strap being provided for each of the container side wall seams and folded along its length so that longitudinal portions of said straps overlay each of the outwardly facing edges of the container side wall panel, and being continuously secured therethrough over a major portion of the height of the container so that each lift strap is interconnected with at least two thicknesses of container material.

4,143,797

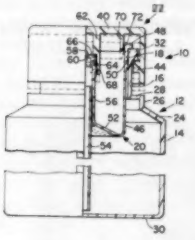
METERING DISPENSER WITH CHILD RESISTANT, TIGHTLY SEALING CLOSURE

Richard B. Reed, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 11, 1975, Ser. No. 603,555

Int. Cl.² B65D *37/00*

U.S. Cl. 222—207 **5 Claims**



1. A child resistant package comprising a container having a generally cylindrical finish defining a generally open and unobstructed mouth opening and provided with a plurality of radially outwardly extending locking lugs, a cup-like fitment carried within said container finish and having a flexible and resilient bottom wall spaced apart from said container mouth opening and a dispensing stem carried by said bottom wall generally coaxially within said bottle finish and extending toward said mouth opening, and a closure cap having a skirt for surrounding said container finish and provided with a plurality of inwardly directed lugs for latching engagement with said container lugs and a central stem for engaging said dispensing stem, said dispensing stem having at least one dispensing orifice adjacent its distal end and said central stem being provided at its distal end with a closed end counterbore for receiving said dispensing stem distal end therewithin and a sealing flange extending generally annularly within said counterbore around said dispensing stem slidably sealingly engaging said dispensing stem generally annularly therearound and proximally of said dispensing orifice, said counterbore terminating at a generally annular shoulder, wherein engagement of said shoulder with the distal end of said dispensing stem depresses said stem and flexes said cup bottom wall to bias said closure cap outwardly of said container mouth and thereby lock said container and cap lugs against inadvertent disengagement and require that a child resistant push and turn motion be applied to open the package.

4,143,798

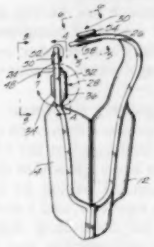
SAFETY STRAPS FOR HOLSTERS

Neale A. Perkins, Sierra Madre, Calif., assignor to Safariland Ltd. Inc., Monrovia, Calif.

Continuation-in-part of Ser. No. 663,545, Mar. 3, 1976, abandoned, which is a division of Ser. No. 529,898, Dec. 5, 1974, Pat. No. 3,955,724. This application Mar. 10, 1977, Ser. No. 776,316

Int. Cl.² F41C *33/02*

U.S. Cl. 224—243 **17 Claims**



1. In a holster for carrying a firearm and comprising a case having a safety strap for securing a firearm in the case, a metal snap ring fastener secured to an inside surface portion of the case for use in holding the safety strap over the firearm, the snap ring fastener having a peripheral wall extending a predetermined distance into the interior of the case, the improvement comprising a shield surrounding the peripheral wall of the snap ring fastener, the shield being made from a material having a hardness less than that of the peripheral wall, the shield and the snap ring fastener being disposed in a hole formed in the case to recess the shield and the fastener with respect to the inside surface of the case, a reinforcing member overlying an outside surface of the case so as to bridge the hole in the case, and an attachment element extending through the reinforcing member for securing the shield and the snap ring fastener in the hole of the case, the shield extending farther into the interior of the case than said peripheral wall so a firearm removed from or replaced in the case can slide against the shield and not the peripheral wall of the fastener.

4,143,799

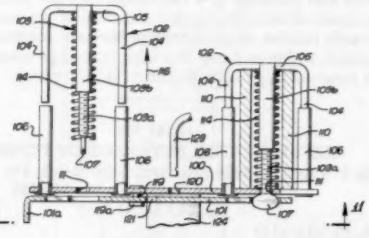
SKI RACK, FOR VEHICLES

Robert W. Dietlein, and William R. Dietlein, both of 3040 Deer Run Rd., Carson City, Nev. 89701

Filed Sep. 29, 1977, Ser. No. 837,765

Int. Cl.² B60R *9/00*

U.S. Cl. 224—301 **10 Claims**



1. In a ski rack for vehicles, the combination comprising

(a) structure including a transversely elongated base and defining multiple leg openings,

(b) a U-shaped ski retainer having legs projecting in two of said openings,

(c) a keeper having a locking position in which the keeper

cooperates with at least one of said legs to prevent withdrawal of said retainer relatively away from the base, the keeper movable relative to the base to allow said withdrawal of the retainer relatively away from the base,

(d) whereby a portion of the ski projecting between the base and a cross-piece defined by the retainer may be retained therebetween when the keeper is in said locking position,

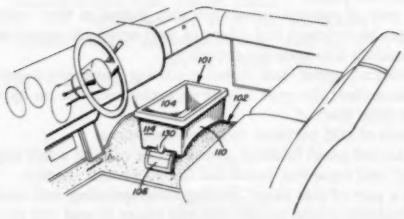
(e) the legs of the retainer including one leg located between two guide legs, said legs extending generally normal to the base, said structure including guides carried by the base for slidably and telescopically receiving said guide legs, there being a head on said one leg captured by the keeper in said locking position.

4,143,800

LITTER BOX

James A. McCaffrey, Norcross, Ga., assignor to Diversified Plastics Products Inc., Norcross, Ga.

Filed Mar. 10, 1978, Ser. No. 885,314
Int. Cl.[2] B60R *11/00*
U.S. Cl. 224—42.42 R **3 Claims**



1. In an automobile litter box including an enclosed volume open at one end which provides a receptacle with a base which is adapted to rest upon the outer periphery of an automobile transmission and driveshaft tunnel, the improvement comprising:

a pair of arcuate arms rotatably mounted at opposing ends of said base by hinge means associated with each arm and a corresponding end of said base; said hinge means being comprised of a pair of prongs for each arm extending axially outwardly, and bearing means within each opposing end of said base for receiving said prongs; means for applying spring-like compressive force to at least one of said arms and thereby providing the compressive frictional engagement of said arms with the outer periphery of an automobile transmission and driveshaft tunnel; said means for applying spring-like compressive force being comprised of said arms being resiliently flexible, and an extension integrally formed with each side corresponding to each base end which extends downwardly and removably engages said arm at the axial center thereof to flex said arm laterally when upward force is applied to said arm, said flexing, tending to force said arm downwardly.

4,143,801

MULTIPLE WELDING HEAD SYSTEM FOR FABRICATING PIPE

Claud B. Sargent, Miloxi, Mich., assignor to Michael P. Breston, Houston, Tex., a part interest

Filed Feb. 9, 1977, Ser. No. 767,172
Int. Cl.[2] B23K *9/00, 37/02, 31/06*
U.S. Cl. 228—17.5 **4 Claims**

1. A system for fabricating a pipe from rolls of flat metal plate, comprising:

means for continuously moving the plate;

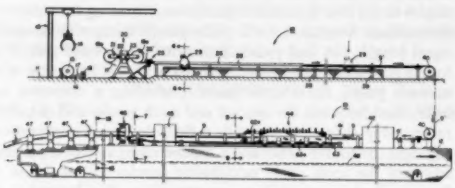
pipe forming means for shaping the moving plate into a pipe having a longitudinal seam therealong;

a leapfrog arc welding machine having a pair of independently movable welding units movably positioned on the opposite sides of the moving pipe,

each welding unit comprising a carriage movable in the same direction and at the same speed as the moving pipe, a carrier movable over the carriage, and

a bank of equally spaced-apart welding heads pivotably mounted on said carrier;

the welding heads of one welding unit welding equal and overlapping portions of one section of the longitudinal



seam, when its carriage is moving with the pipe and its carrier is moving opposite thereto, while the welding heads of the other welding unit are positioned to weld a consecutive overlapping section of the longitudinal seam when the welding heads of said one welding unit stop welding, whereby said pair of welding units alternatingly weld alternate and overlapping sections of the longitudinal seam without interfering with the continuous movement of the pipe.

4,143,802

FLUXLESS BRAZE PROCESSING OF ALUMINUM

Walter L. Winterbottom, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 5, 1977, Ser. No. 839,707
Int. Cl.[2] B23K *1/04*
U.S. Cl. 228—217 **4 Claims**

1. A method of fluxless brazing of aluminum parts comprising:

(a) preparing and structurally relating together base metal parts, consisting of at least aluminum or aluminum alloy, to form an assembly,

(b) depositing a filler metal consisting essentially of an aluminum-silicon-magnesium alloy, said metal being deposited at joining sites for said assembly,

(c) subjecting said assembly to heating within a furnace and controlling the heating rate of the assembly therein so that when the assembly experiences a temperature within the range of 400°–590° C., the heating rate is sufficiently rapid to avoid porosity in any oxide film on said assembly and avoid reactions of the aluminum in said assembly with gaseous oxygen or water in the environment surrounding said assembly within the furnace, and

(d) continuing said heating of said assembly above said critical temperature range to effect brazing.

4,143,803

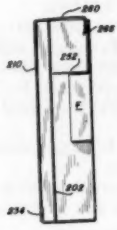
CONTAINER SYSTEM FOR GARAGE DOOR OPENER

Robert E. Taylor, Evanston, Ill., assignor to Chamberlain Manufacturing Corporation, Elmhurst, Ill.

Division of Ser. No. 657,051, Feb. 11, 1976, Pat. No. 4,03[illegible]9.
This application Mar. 28, 1977, Ser. No. 782,237
Int. Cl.[2] B65D *5/48*
U.S. Cl. 229—27 **1 Claim**

1. A variable capacity carton having seven elongated panels including a first rectangular panel, a second rectangular panel larger than the first panel and longitudinally hinged at one end thereof to one end of the first panel, a third rectangular panel similar in size to the first panel and hinged at one end to the other end of the second panel, a fourth panel similar in size to the second panel and longitudinally hinged along one end to the other end of the third panel, a fifth rectangular panel longi-

tudinally hinged along one end to the other end of the fourth panel, a sixth rectangular panel similar in size to be the fourth panel and longitudinally hinged along one end to the other end of the fifth panel, a seventh rectangular panel similar in size to the fifth panel and longitudinally hinged along one end to the other end of the sixth panel, said carton constructed and arranged to be erected to rectangular or box form with the fourth and sixth panels being spaced parallel to each other and forming the longitudinal sidewalls of the carton and the fifth and seventh panels being spaced parallel to each other at right angles to the fourth and sixth panels and forming the transverse sidewalls of the carton, each of the panels being of substantially equal length, the first panel secured to the interior side of the fourth panel, the third panel secured to the interior side of the seventh panel, the second panel providing a common wall interposed between the second and sixth panels and in parallel relationship thereto to provide a first elongated compartment adjacent the fourth panel and a second elongated compartment adjacent the sixth panel occupying greater volume than the first compartment, a first upper transverse flap hinged to the top edge of the fifth panel, a second upper transverse flap hinged to the top edge of the seventh panel, a top flap hinged to the upper edge of the fourth panel and cooperating with the first and second upper transverse flaps to provide the top walls of the carton, a rounded edged flap hinged to the upper edge of the top flap for positioning adjacent the sixth panel, a first upper rectangular flap having a longitudinal edge hinged to the upper edge of the sixth panel, a second upper rectangular flap having a longitudinal edge hinged to another longitudinal edge



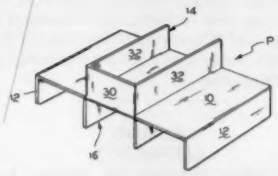
of the first upper rectangular flap, a third upper rectangular flap similar in size to the first upper rectangular flap and having a longitudinal edge hinged along the other longitudinal edge of the second upper rectangular flap, the upper rectangular flaps constructed and arranged to provide a chamber or cavity at the upper end of the second compartment for receiving a transmitter comprising part of the electric garage door opener, a first lower transverse flap hinged to the bottom edge of the fifth panel, a second lower transverse flap hinged to the bottom edge of the seventh panel, a bottom flap hinged to the bottom edge of the sixth panel, a lower rounded edged flap hinged to the lower edge of the bottom flap, the bottom flap cooperating with the lower transverse flaps to provide the bottom wall of the carton, the fifth panel being horizontally severed to provide a first rectangular pocket flap hinged along a vertical score line in the fifth panel, the sixth panel being horizontally severed to provide second and third rectangular pocket flaps with the second pocket flap hinged along a vertical score line in the sixth panel and a third rectangular pocket flap hinged along another vertical score line in the sixth panel, the seventh panel being horizontally severed to provide a fourth rectangular pocket flap hinged along a vertical score line in the seventh panel, the rectangular pocket flaps being substantially equal in size with the first pocket flap hinged to the second pocket flap and the third pocket flap hinged to the fourth pocket flap and the pocket flaps being movable into the interior of the carton for partially blocking the second elongated compartment to hold a first sized receiver to an outward position avoiding blockage of the second elongated compartment for optionally accommodating storage of a second sized elongated receiver.

4,143,804

PARTITION WITH INTEGRAL TIER SEPARATOR

Pranas Visvydas, Bell Gardens, Calif., assignor to Container Corporation of America, Chicago, Ill.

Filed Mar. 13, 1978, Ser. No. 885,482
Int. Cl.[2] B65D *5/48*
U.S. Cl. 229—42 **3 Claims**



1. A partition, formed of a unitary blank of foldable paperboard, for forming a plurality of cells in separated tiers, comprising:

(a) a generally rectangular, horizontally disposed, flat, tier separator panel;

(b) a pair of support panels foldably joined at their upper edges to opposed end edges of said separator panel and extending downwardly therefrom;

(c) integral upper and lower partition members located intermediate the ends of said separator member on opposite sides thereof;

(d) each of said partition members including:

(i) an end panel foldably joined at one edge to a side edge of said separator panel and folded normal thereto;

(ii) a pair of side panels having corresponding end edges foldably joined to opposed end edges of said end panel and folded to extend normal to the respective planes of said end panel and said separator panel;

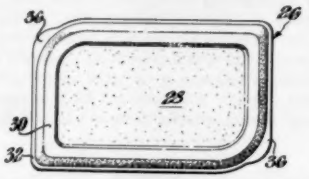
(e) at least one of said side panels of said upper partition member having a locking foot projecting downwardly from the free end of said panel.

4,143,805

CONTAINER LATCHING ARRANGEMENT

John T. Sutton, Belgrade, Me., assignor to Keyes Fibre Company, Waterville, Me.

Filed Sep. 19, 1977, Ser. No. 834,177
Int. Cl.[2] B65D *5/66*
U.S. Cl. 229—44 R **6 Claims**



1. A molded container comprising two non-identical mating portions capable of packaging a product therebetween in the closed mating position thereof, one of said portions being a lower protion with a floor and an upstanding peripheral side wall terminating in a peripheral rim, the other of said portions being an upper portion with a top wall and a depending peripheral side wall terminating in a peripheral rim, said peripheral rims in said closed mating position contacting each other along a geometric configuration having a plurality of corners with one of said rims being disposed inwardly of the other of said rims at at least two of said corners, a narrow horizontal slot in the outward of said rims at only two of said corners, a tongue on the inward rim at said only two corners, said only two

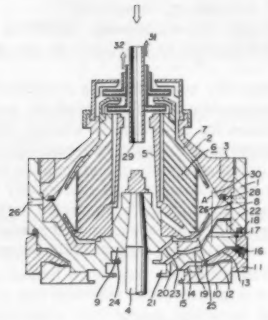
corners comprising locking corners, each of said tongues being inserted through a respective of said slots to maintain said portions in said closed position, said peripheral rim of said bottom portion including a ledge having a generally horizontal shoulder and an upwardly extending wall, said slots being in the general area of the juncture of said horizontal shoulder and said upwardly extending wall, said peripheral rim of said upper portion terminating in a horizontal plane and being shaped and dimensioned to fit within said upstanding wall of said ledge and to rest upon said horizontal shoulder, said upstanding wall of said ledge surrounding said peripheral rim of said upper portion at the adjacent walls forming said two locking corners except for said tongues which extend outwardly beyond said upstanding wall of said ledge when said two portions are mated in said closed position, said tongues being generally horizontal when inserted through said slots in said closed position, and said tongues and said slots at said locking corners being the sole detachable locking elements integral with said container.

4,143,806

CENTRIFUGAL SEPARATOR

Masahiro Moriguchi, Yokohama, Japan, assignor to Mitsubishi Kakoki Kaisha Ltd., Tokyo, Japan

Filed Nov. 11, 1977, Ser. No. 850,661
Claims priority, application Japan, Aug. 30, 1977, 52/103134
Int. Cl.[2] B04B *1/14*
U.S. Cl. 233—20 A **3 Claims**



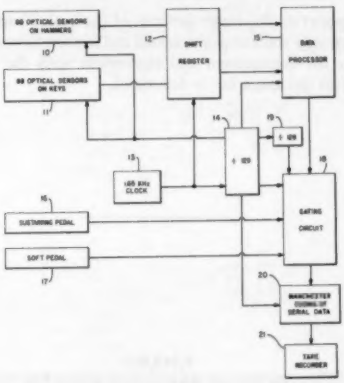
1. In a centrifugal separator for separating components of differing densities, which comprises a rotary body having an outlet at the peripheral part and a sliding valve cylinder which vertically slides in a rotary shell of the rotary body, and a lower passage of the sliding valve cylinder formed between the bottom of the rotary shell and the sliding valve cylinder, and said lower passage being connected to a first functional fluid inlet; an improvement which comprises a conduit which is connected to an inner part of the lower passage of the sliding valve cylinder and which is opened and closed by the movement of a pilot sliding cylinder which is vertically slidably connected under the rotary shell to form an upper passage and a lower passage, said lower passage being shorter than said upper passage, said lower passage and upper passage being connected to a second functional fluid inlet independent from said first functional fluid inlet, and said upper passage being connected to a nozzle, and a valve seal ring positioned for contacting with the peripheral part of the sliding valve cylinder, and a pilot sealing ring positioned for contacting with the peripheral part of the pilot sliding cylinder; whereby the shorter length of the lower space of the pilot sliding cylinder causes said pilot sliding cylinder to move downward due to centrifugal hydraulic pressure when fluid fills both passages by way of said second functional fluid inlet which in turn opens said conduit at said pilot sealing ring thereby releasing the functional fluid in said inner part of said lower passage of said sliding valve cylinder so that said outlet is opened and closed at said valve seal ring by balancing the centrifugal hydraulic pressure caused by the functional fluid maintained in the outer part of said lower passage of said sliding valve cylinder against the centrifugal hydraulic pressure caused by the components fed into the rotary body, whereby the components may be partially discharged.

4,143,807

MUSIC ROLL PERFORATING PROCESS AND APPARATUS

Mogens Ravn, Santa Monica, Calif., assignor to Play-Rite Music Rolls, Inc., Turlock, Calif.

Filed Feb. 16, 1978, Ser. No. 878,256
Int. Cl.[2] G06K *1/05*
U.S. Cl. 234—3 **10 Claims**



1. A process for producing perforated tape recordings of a piano type musical instrument having key actuated hammers producing note sounds, comprising the steps:

sensing the striking of hammers and the position of corresponding keys while producing digital output signals indicative of the striking and/or position of each;

serially gating the digital output signals and producing a second digital signal indicative of the musical rendition played based upon changes in the striking of the hammers and the position of the keys over a period of time;

recording the second digital output signal; and

interfacing said recording and music roll perforating machine with a computer and perforator driver box, said computer being programmed to read the recorded second output signal, calculate the rate of perforation and operate the music roll perforating machine through said perforator driver box.

4,143,808

TYPEWRITER WORD COUNTER

George Klavitter, 30233 Rosebriar, St. Clair Shores, Mich. 48082

Filed Aug. 8, 1977, Ser. No. 822,526
Int. Cl.[2] B41J *29/24*
U.S. Cl. 235—102 **3 Claims**

1. Word counter apparatus for a typewriter having a space bar and casing with a top wall and an adjacent side wall comprising:

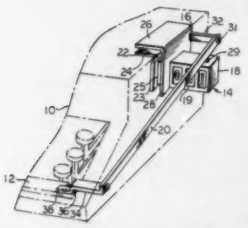
a support;

a push button counter secured to said support;

a lever having one end portion pivotally connected to said support for movement about a substantially horizontal axis, an intermediate portion supported by the counter push button, and another end portion having a first substantially horizontal section, a substantially vertical inter-

mediate section, and a second substantially horizontal end section; and

magnet means for magnetically detachedly positioning said



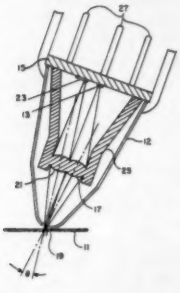
support on the outer surfaces of the casing top and adjacent side walls to position said end section below the space bar for engagement and movement with the space bar when the space bar is depressed.

4,143,809

OPTICAL BAR CODE READER

John J. Uebbing, Palo Alto, and Perry Jeung, Sunnyvale, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 11, 1977, Ser. No. 840,874
Int. Cl.[2] G06K *7/10, 7/14;* G08C *9/06*
U.S. Cl. 235—462 **3 Claims**



1. An optical bar code reader for sensing a bar code on a surface, comprising:

a housing;

optical source means disposed in said housing for generating an optical beam;

a first lens disposed in said housing to focus said optical beam onto a small area of said bar code;

optical detecting means disposed in said housing for detecting a reflected optical beam incident thereon; and

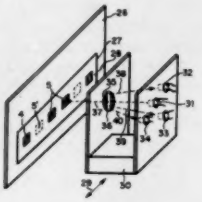
a second lens disposed in said housing to focus said optical beam reflected from said bar code onto said optical detecting means, said first and second lens each being an integral portion of a single molded support.

4,143,810

DOCUMENTS CODED BY MEANS OF MACHINE-READABLE OPTICAL MARKINGS

David L. Greenaway, Birchwil, England, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Nov. 16, 1976, Ser. No. 742,260
Claims priority, application Switzerland, Dec. 23, 1975, 16656/75
Int. Cl.[2] G06K *19/06, 7/10;* G02B *5/32*
U.S. Cl. 235—487 **10 Claims**



1. A coding device for cancelling or altering selected optical markings, for use in producing a machine-readable coded document having an information carrier with a multiplicity of storage positions, wherein selected storage positions are occupied by respective machine-readable optical markings, which markings cause a predetermined modification of incident light and whose geometrical position on the information carrier represents coded information, comprising:

introducing means for introducing numerical or alphanumerical information to be coded on the information carrier;

converting means for converting the numerical or alphanumerical information into binary symbols; and

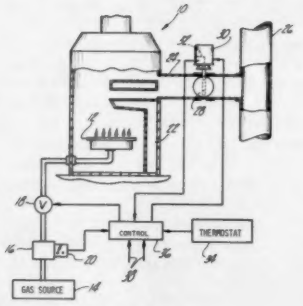
cancellation means for cancelling or altering selected said optical markings in accordance with said binary symbols, to code the information onto the information carrier, said cancellation means comprising a multiplicity of heating elements which are electrically connected to the converting means, and which are arranged in the same geometrical position as the storage positions of the documents to be coded.

4,143,811

GAS FLOW CONTROLLED FURNACE FLUE DAMPER

Karl Sattmann, 941 Viewland, Rochester, Mich. 48063

Filed Jun. 6, 1977, Ser. No. 803,483
Int. Cl.[2] F23N *1/06, 5/18*
U.S. Cl. 236—1 G **13 Claims**



1. A control system for a combustion heating device having a fluid fuel input line and an exhaust flue, comprising: a damper supported in the flue for motion between open and closed positions; a drive system for the damper operative to move the

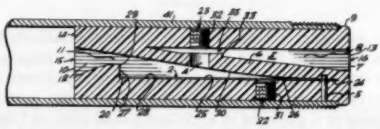
damper between open and closed positions; an electric switch having an output dependent upon the position of the damper; an electrically energized valve disposed in said fuel line; a flow detector supported in said fuel line operative to provide an electrical output signal having a first state when fuel is flowing through the line and a second state when no appreciable fuel is flowing through the line and electric control circuit means interconnecting the drive system, the switch, the flow detector and the valve preventing energization of the valve to allow fuel flow through the line until the output of the switch is such as to indicate that the damper is open and causing said damper drive system to maintain said damper in said open position and to cause the drive system to move the damper to its open position when it is not in its open position whenever said flow detector electrical output signal is in its first state and fuel flow is occurring through said line, whereby the damper is prevented from blocking the exhaust flue while fuel is being provided to the furnace.

4,143,812

THERMOSENSITIVE SAFETY VALVE

Jeffrey L. Fortune, 3901 40th St. S., St. Petersburg, Fla. 33711

Filed Oct. 3, 1977, Ser. No. 838,869
Int. Cl.² G05D *23/10*
U.S. Cl. 236—48 R **12 Claims**



1. A thermosensitive safety valve for cutting off a supply of fluid, comprising:

casing means having formed therein a duct with said duct having an upstream fluid inlet and a downstream fluid outlet,

said casing means having an interiorly disposed partition wall interposed within said duct to define an upstream cavity and a downstream cavity,

a passage formed within said partition wall for fluid transfer between said upstream cavity to said downstream cavity,

thermoresponsive reed means positioned in said upstream cavity having an attached portion and an unattached portion disposed upstream relative to said attached portion,

said casing means having a ledge positioned adjacent said unattached portion in upstream fluid flow protecting disposition relative to said unattached portion,

said thermoresponsive reed means having a non-flexed normal position with said unattached portion of the same disposed in non-interrupting fluid position when the temperature of the fluid is below a predetermined value,

said thermoresponsive reed means disposed in adjacent relationship to the inner duct wall of said casing means within said upstream cavity when in said non-flexed normal position whereby said ledge prevents the fluid flow from lifting said unattached portion,

said thermoresponsive reed means having a flexed intermediate position with said unattached portion of the same at least partially disposed within the main stream of fluid flow passing through said upstream fluid inlet upon the temperature of the fluid reaching the predetermined valve,

said unattached portion spaced apart from the inner duct wall of said casing means by a distance greater than the outer extremity of said ledge when in said flexed intermediate position whereby said ledge no longer protects said unattached portion from the main stream of fluid flow,

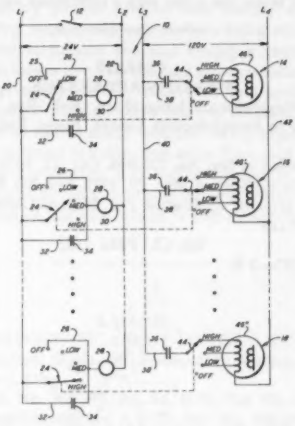
said thermoresponsive reed means having a fluid restricting position with the unattached portion of the same disposed in partially sealing engagement with said passage of said partition wall upon interaction of said unattached portion with the main stream of fluid flow.

4,143,813

AIR CONDITIONING CONTROL AND METHOD OF OPERATION

David F. Bryans, Cazenovia, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed May 30, 1978, Ser. No. 910,808
Int. Cl.² G05D *23/00*
U.S. Cl. 236—51 **5 Claims**



1. A method of controlling the operation of a plurality of air conditioning units, installed in separate rooms of a multi-room building, with each unit having its own on-off switch to selectively connect the unit to a source of electrical power, comprising the steps of:

simultaneously interrupting the electrical power supplied to each air conditioning unit to place each unit in an off state;

renewing the supply of electrical power to each unit; and

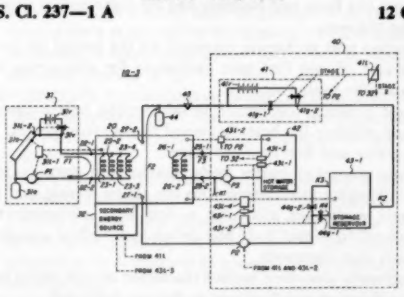
preventing the restarting of any one unit once the supply of electrical power has been renewed until the unit's on-off switch has been manually moved from its on position to its off position.

4,143,814

CONTROL AND TRANSFER OF ENERGY

John A. Hill, Jr., Sherborn, Mass., assignor to Ultimate Engineering Corporation, Natick, Mass.

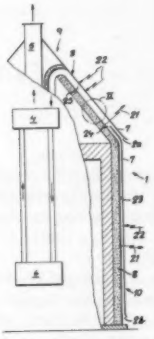
Filed Sep. 8, 1976, Ser. No. 721,496
Int. Cl.² F24J *3/02*
U.S. Cl. 237—1 A **12 Claims**



1. An energy transfer system, which comprises a heat exchanger;

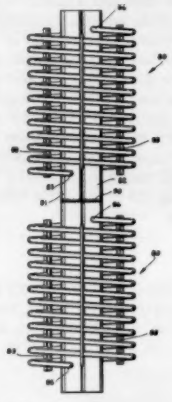
a first source of energy for said heat exchanger;
a second source of energy for said heat exchanger;
storage means having a capacity exceeding that of said exchanger;
means for transferring energy from said heat exchanger to said storage means,
said first source of energy comprises means for applying energy of solar origin to said heat exchanger;
said energy of solar origin in excess of a prescribed level is radiated into the atmosphere by an auxiliary radiator;
said heat exchanger is a boiler that is heated by said second source;
and said boiler has a flue with a motorized, fail-safe damper.

4,143,815
HEATING APPARATUS
Helmut Meysenburg, Heiligenhaus, Fed. Rep. of Germany, assignor to Energietechnik GmbH, Essen, Fed. Rep. of Germany
Continuation of Ser. No. 735,006, Oct. 22, 1976, abandoned. This application Mar. 20, 1978, Ser. No. 888,327
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1975, 2547214
Int. Cl.[2] F24J *3/02*
U.S. Cl. 237—2 B **10 Claims**



1. A heating apparatus for a building, comprising:
a first heat exchanger in the form of a duct disposed along a wall of said building and having an air inlet open to the exterior, said first heat exchanger being arranged and constructed to transfer heat lost through said wall of the building and solar energy impinging upon said wall of the building to air traversing said first heat exchanger;
means for inducing the flow of air from the exterior through said first heat exchanger whereby said air is heated by the heat lost from said building and the solar energy impinging thereon;
a second heat exchanger traversed by the heated air downstream of said first heat exchanger for abstracting heat from the heated air;
a heat consumer connected to said second heat exchanger and utilizing the heat abstracted therein from the air traversing said first heat exchanger;
a heat-absorbing buffer body within said duct in heat-exchanging relationship with the air traversing said first heat exchanger and with a first heat exchanger wall spaced from said body and defining an airflow passage of said duct therewith;
a thermally absorbent surface blackened on said buffer body confronting said first heat exchanger wall; and
a heat-reflective coating on an inner surface of said first heat exchanger wall confronting said thermally absorbent surface.

4,143,816
FIREPLACE HEATING SYSTEM
David A. Skadeland, Rte. 5, Plantation Rd., Fayetteville, Ga. 30214
Filed May 17, 1976, Ser. No. 687,376
Int. Cl.[2] F24D *3/08*; F24H *1/22*; F28F *13/00*
U.S. Cl. 237—8 R **2 Claims**

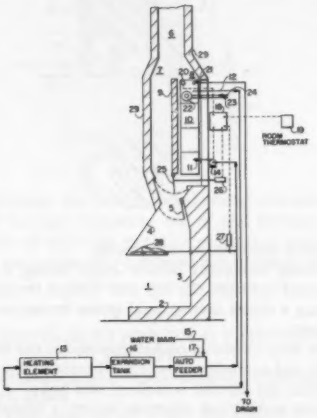


1. In a heat exchange system wherein relatively hot gases pass through a flue, a first heat exchanger is disposed in said flue with a heat exchange medium flowing therethrough for absorbing heat from said relatively hot gases, a second heat exchanger is disposed in a relatively cool area, and said second heat exchanger is communicably connected with said first heat exchanger so that said heat exchange medium flows through said second heat exchanger for dissipating heat from said heat exchange medium, the improvement wherein said first heat exchanger comprises a first manifold for receiving said heat exchange medium from said second heat exchanger, a single helical coil having a first lower end fixed in communication with said first manifold for receiving said heat exchange medium from said first manifold, and a second upper end, a second manifold adjacent and parallel to said first manifold, said second upper end of said single helical coil being fixed in communication with said second manifold so that said second manifold receives said heat exchange medium from said single helical coil, and coil support means for maintaining successive convolutions of said single helical coil in spaced relation with respect to one another, said first manifold and said second manifold being so constructed and arranged as to receive a like pair of manifolds in end-to-end relationship therewith, said like pair of manifolds having a second single helical coil thereabout and in communication therewith, said single helical coil and said second single helical coil being two of a plurality of single helical coils, all of said plurality of single helical coils being co-axially positioned in said flue, each of said plurality of single helical coils having a first end fixed to said first manifold and a second end fixed to said second manifold so that said plurality of single helical coils are connected in parallel with one another.

4,143,817
AUTOMATIC FIREPLACE HEATING SYSTEM
John F. Oliver, 112 W. 31st St., Wilmington, Del. 19802
Filed Feb. 17, 1977, Ser. No. 769,726
Int. Cl.[2] F24B *7/00*
U.S. Cl. 237—51 **3 Claims**

1. Automatically controlled residential heating system based on the heat from a fireplace comprising a fireplace, hearth, combustion zone, flue, and damper for opening and closing the passageway from the combustion zone to the flue, said flue being divided into two full-sized parallel independent flue passages, one of which is an unobstructed normal flue passage

and the other of which is filled with a heat exchanger adapted to absorb the heat from hot gases passing through the flue into a fluid in said heat exchanger, a movable diverter adapted to direct the hot gases into either parallel flue or into both in any desired proportion, a means for circulating a heat absorbing fluid through said heat exchanger and releasing the absorbed heat through space heaters at other locations, means for sensing the heat in the space to be heated by space heaters, means



for sensing the temperature of the fluid in said heat exchanger, means for automatically positioning said diverter to by-pass none, all, or any part of said hot gases from said heat exchanger in response to the temperatures of the two said sensing means, means to relieve any undue build-up of heat in said heat exchanger, and means to automatically extinguish the burning material in said combustion zone if the means for sensing the temperature in said heat exchange fluid indicates an undesirably high temperature.

4,143,818

RAIL FASTENING APPARATUS

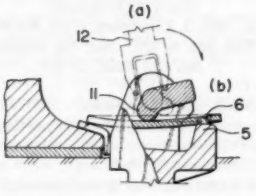
Kentaro Matsubara, and Yoshio Matsuo, both of Tokyo, Japan, assignors to Tetsudo Kizai Kogyo Company Limited, Tokyo, Japan

Filed Jul. 20, 1977, Ser. No. 817,161

Claims priority, application Japan, Jan. 31, 1977, 52-009307[U]

Int. Cl.[2] E01B *9/30, 9/34, 9/48*

U.S. Cl. 238—349 **5 Claims**



1. In a rail fastening apparatus for cooperation with a rail which is supported on and extends transversely across a tie, said fastening apparatus including a steel support positioned adjacent one side of the rail and having a lower portion which is fixed to the tie and an upper portion which projects upwardly above the tie, cam means pivotally supported on said upper portion for swinging movement about an axis which extends substantially parallel with the longitudinally extending direction of the rail, spring-receiver means mounted on said tie and positioned on the opposite side of said axis from said rail, and elongated plate-like spring means extending between said spring-receiver means and said rail, said spring means having one end thereof supported on said spring-receiver means and the other end thereof supported on a flange of the rail, said spring means being disposed below said cam means and positioned so that said cam means is adapted for engaging a central portion of said spring means, whereby rotation of said cam means causes it to engage said spring means and resiliently deflect same downwardly to thereby press the rail securely against the tie, comprising the improvement wherein said cam means includes a radially projecting cam portion having a rounded smoothly curved exterior cam surface engageable with said spring means, said cam surface being eccentrically positioned relative to said axis and having a profile which causes the cam means to rotate through an over-center position when being pivotally moved relative to said spring means between a released position and a holding position, said cam portion when in said holding position being urged by said spring means to rotate in a direction away from said over-center position, and stationary stop means engageable with said cam means when the latter is in said holding position for preventing rotation of said cam means in said direction.

4,143,819

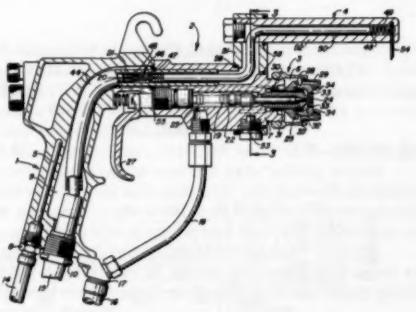
ELECTROSTATIC SPRAY COATING GUN

Donald R. Hastings, Elyria, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Division of Ser. No. 705,338, Jul. 14, 1976, Pat. No. 4,079,894. This application Nov. 3, 1977, Ser. No. 848,049

Int. Cl.[2] B05B *5/00*

U.S. Cl. 239—707 **12 Claims**



1. An electrostatic spray coating gun comprising:

a barrel having a coating material passage through it and a spray nozzle at one end of the passage which is capable of producing a spray pattern, the barrel further having an electrical passage in it;

an electrically nonconductive extension member having an electrical passage in it, said extension being mounted on the barrel for angular turning displacement about the barrel;

a pliably flexible electrical conductor having a first end extending into the electrical passage in the extension member and a second end extending into the electrical passage in the barrel, wherein the second end of the conductor is adapted to be connected to a source of high voltage electrical power;

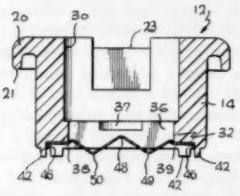
charging means extending from the extension to impart an electrical charge on the sprayed coating material; and

an electrical connection between the charging means and the first end of the conductor.

4,143,820
EMITTER FOR DRIP IRRIGATION SYSTEMS

Elvin M. Bright, Sr., 17242 Bircher St., Granada Hills, Calif. 91344

Filed Mar. 8, 1977, Ser. No. 775,592
Int. Cl.[2] B05B *15/00*
U.S. Cl. 239—108 33 Claims

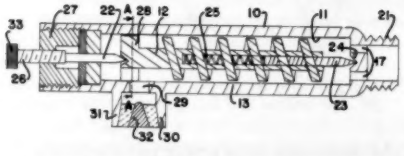


1. An emitter for drip irrigation systems comprising:
a body having a flow aperture;
resilient means disposed in and substantially enclosing the flow aperture and deflectable through one range of positions to define with the body at least one flow aperture that diminishes in size with increased pressure to provide flow equalization for pressure variations over a predetermined pressure range, and being deflectable outside the range of positions to define with the body at least one different flow aperture to provide high velocity flushing flow at pressures above the predetermined pressure range.

4,143,821
FLUIDIC ROTATION OF TUBED SCREW

Elie P. Aghnides, 795 Fifth Ave., New York, N.Y. 10021

Filed Mar. 18, 1977, Ser. No. 779,129
Int. Cl.[2] B05B *1/08*
U.S. Cl. 239—381 20 Claims

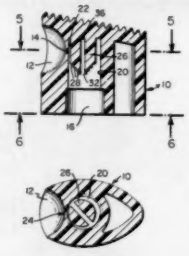


1. In a device operated by water under pressure comprising:
a conduit having an opening with an inlet end for receiving water under pressure and a showerhead comprising a hole in the side wall of said conduit,
input means connecting said inlet end to a source of water under pressure,
a helical screw having threads whose dimension perpendicular to its axis is slightly less than the transverse dimension of said opening, said threads including means to rotate the screw as water under pressure flows from said inlet and through said opening, and
means driven by the rotation of said screw for pulsating the water fed to said hole, to thus provide a pulsating output stream from said showerhead,
said hole being adjacent the downstream end of said helical screw so that water from said inlet end must pass along said helical screw and thus rotate the screw in order to reach said hole.

4,143,822
VALVE STEM BUTTON

Robert A. Bennett, 170 Sturbridge Rd., Easton, Conn. 06425

Filed Dec. 9, 1977, Ser. No. 858,953
Int. Cl.[2] B05B *1/34*
U.S. Cl. 239—490 6 Claims



1. A valve stem button comprising:
a vertically elongated hollow body having a lateral face disposed between the top and bottom thereof, said face having a recess therein, said recess having an outlet port therein;
a valve stem receiving socket disposed in the bottom of the body and extending upwardly therein to a position intermediate the top and bottom of said body.
a vertical cylindrical chamber having a closed cylindrical inner wall and disposed in said body intermediate the top of the socket and the top of said body, said wall having an inlet port aligned with but spaced from said outlet port, said chamber having a vertical axis;
a first horizontal straight conduit disposed between and interconnecting said inlet and outlet ports, said first conduit having a horizontal axis which intersects the chamber axis to define a vertical plane therewith; and
a vertically elongated cylindrical member extending downwardly from the top of the member in the chamber, the lower end of the member being spaced above the top of the socket, the diameter of the member being smaller than that of the chamber, the member being spaced from the inner wall, the member having a vertical axis lying in said vertical plane and offset from the chamber axis, the member axis being disposed between the axis of the chamber and said inlet port, the lower end of said member having an inlet orifice, the outer cylindrical surface of said member having an outlet orifice spaced horizontally from the inlet port, said member containing a second conduit interconnecting the inlet and outlet orifices.

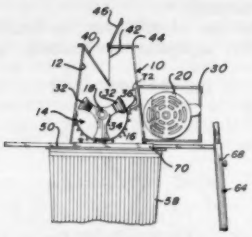
4,143,823
HAMMERMILLS

Carl Judson, Jr., Rte. 2, Livermore, Colo. 80536

Filed Sep. 6, 1977, Ser. No. 830,882
Int. Cl.[2] B02C *13/06*
U.S. Cl. 241—73 9 Claims

1. A hammermill which comprises:
an upright housing including an upper portion which defines a material-receiving chamber and a lower portion which defines a comminution chamber;
an apertured screen disposed in the bottom of said comminution chamber for permitting the gravity discharge of material comminuted within said lower portion;
a shaft mounted horizontally within said lower portion;
means for driving said shaft in rotation;
and a plurality of hammers projecting rigidly outward from said shaft, said hammers being arranged in an assembly which includes a succession of hammer-carrying elements integrally carrying respective ones of said hammers and individually spaced successively along said shaft, each of said elements having an integral plurality of said hammers

circumferentially spaced successively around said shaft, and each of said hammers including a material-impacting leading face of concave-arcuate conformation in the plane of movement of said hammers with each of said leading



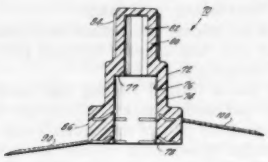
faces merging into a reversely-directed concave trailing face of the next successive one of said hammers on the same side of said shaft and with each set of said merging leading and trailing faces defining a single large concavity.

4,143,824

VESSEL AND BLADES FOR FOOD PROCESSOR, OR THE LIKE

Tadahiko Shiotani, Komaki, Japan, assignor to Sanyei Corporation, Tokyo, Japan

Filed Aug. 29, 1977, Ser. No. 828,281
Int. Cl.² B02C 18/18
U.S. Cl. 241—282.1 **8 Claims**



1. A vessel and blade assembly for a food processor, or the like, comprising:

said vessel having a side wall surrounding and defining an interior space and having a bottom covering and closing off said side wall and defining said interior space;

said bottom having a central portion near the center of the bottom and away from said side wall; said bottom being gradually upraised into said interior space, moving inwardly along said bottom from said side wall toward said central portion of said bottom;

said blade assembly comprising a hub supportable in said vessel interior space above said vessel bottom central portion; said hub having a side periphery; a first blade projecting away from said hub side periphery near said vessel bottom and being supported by said hub for rotation with respect to said vessel near said vessel bottom; said first blade being inclined with respect to said hub so as to extend generally parallel to said vessel bottom;

a second blade projecting away from said hub side periphery in a different direction than the first said blade being positioned along said hub higher off said vessel bottom than said first blade, and also being supported by said hub for rotation with respect to said vessel; said second blade being inclined with respect to said hub so as to also extend generally parallel to said vessel bottom;

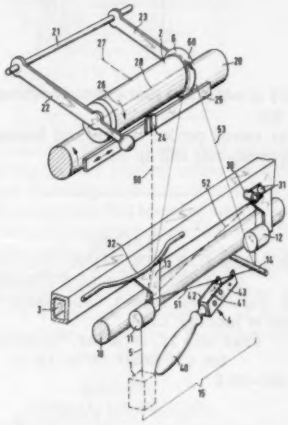
both said blades being of a length to extend nearly into contact with said side wall.

4,143,825

METHOD AND APPARATUS FOR PICKING UP A YARN AND TRANSFERRING IT TO A PIRN AFTER A BOBBIN CHANGE

Kurt Lovas, Ingolstadt, and Hans Landwehrkamp, Lenting, both of Fed. Rep. of Germany, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Apr. 5, 1977, Ser. No. 784,790
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1976, 2616965
Int. Cl.² B65H 54/02, 67/04
U.S. Cl. 242—18 PW **5 Claims**



1. A method of picking up a yarn and transferring it to an empty pirn following exchange with a full bobbin on a yarn winding unit wherein said yarn is extended between a draw-off mechanism and a yarn holding device following severance from said full bobbin comprising the steps of:

providing an auxiliary draw-off mechanism between said draw-off mechanism and said yarn holding device,

positively drawing said yarn from said draw-off mechanism by said auxiliary draw-off mechanism to produce a forced-conveyance zone between said draw-off mechanism and said auxiliary draw-off mechanism, and

picking up said yarn in said forced-conveyance zone and drawing out the yarn into the region of said empty pirn for transfer thereto.

4,143,826

COIL UNWINDER

Enrico Lamperti, Via Ercole Ferrario, 4, Gallarate Varese, Italy

Filed Mar. 10, 1977, Ser. No. 776,472
Claims priority, application Italy, Mar. 10, 1976, 83606 A/76
Int. Cl.² B65H 49/20, 57/18
U.S. Cl. 242—54 R **4 Claims**

1. A coil unwinder comprising:

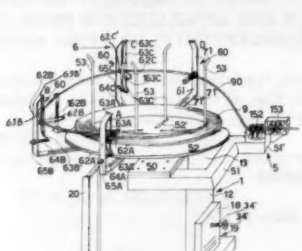
a housing;

a platform rotatably mounted to said housing and adapted to carry the coil,

motor means carried in said housing for rotatably driving said platform,

guide means connected to said housing for guiding one end of the material being unwound from said coil away from said coil, said guide means comprising a vertical support secured to the housing, a pair of spaced and substantially parallel elongated guides secured to the vertical support, said guides extending radially inwardly from the vertical

support with respect to the axis of rotation of said platform and defining a horizontal and radial slot between the guides, a carriage slidably mounted between the guides, and spring means for urging said carriage radially out-



wardly in said slot to abut a thread positioned through said slot, and

transport means carried within said housing for laterally transporting said coil unwinder.

4,143,827

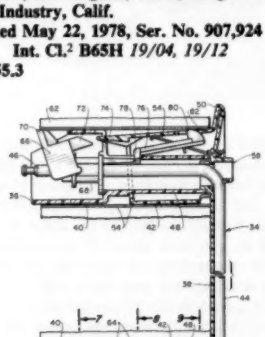
ROLL HOLDER FOR MOUNTING SPLIT-CORE ROLLS OF TISSUE IN A DISPENSER

Council A. Tucker, Los Angeles, Calif., assignor to Towlsaver, Inc., City of Industry, Calif.

Filed May 22, 1978, Ser. No. 907,924

Int. Cl.[2] B65H *19/04, 19/12*

U.S. Cl. 242—55.3 **14 Claims**



1. A roll holder of the type for mounting split-core rolls of tissue and the like in a dispenser, the roll holder retaining a roll in a dispensing position until the tissue thereof is exhausted to automatically uncover axially separable roll core parts while still retaining the same thereon, the roll core parts through limited displacement one relative to the other as urged by the roll holder automatically releasing roll holder latch means permitting the roll holder with the retained core parts to move radially to an exhausted position; the improvements including: blocking means operably associated with the roll holder latch means normally retained in a non-active position through engagement by a portion of certain of said roll core parts permitting said automatic release of said roll holder latch means during roll tissue exhaustion and automatically movable to an active position preventing said automatic release of said roll holder latch means upon a lacking of said certain core part engagement.

4,143,828

WINDER FOR A PAPERMAKING MACHINE

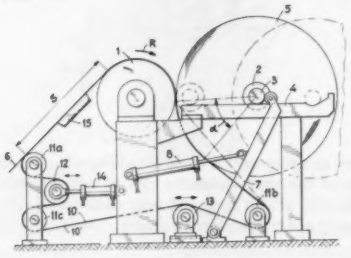
Heinz Braün, Ravensburg; Karl Kiesel, Mochenwangen, and Wolf-Günter Stotz, Ravensburg, all of Fed. Rep. of Germany, assignors to Escher Wyss GmbH, Ravensburg, Wurttenburg, Fed. Rep. of Germany

Filed Apr. 24, 1978, Ser. No. 899,283

Claims priority, application Switzerland, Apr. 26, 1977, 5157/77

Int. Cl.[2] B65H *17/08*

U.S. Cl. 242—65 **6 Claims**



1. A winder apparatus for a paper machine comprising:

a cylinder having an outer surface over which there is guided a paper web moving in a predetermined direction of travel and which is to be wound-up into a paper roll;

a reel-spool for receiving the paper web from the cylinder and for winding-up such paper web thereon into a paper roll;

a contact device for pressing the reel-spool in the direction of the cylinder;

an endless band arrangement; and

guide means for guiding said endless band arrangement so as to extend over said cylinder between said outer surface and the incoming paper web;

said guide means further guiding said band arrangement such that said band arrangement together with said paper web wraps about part of the circumference of the cylinder, is guided between the cylinder and the reel-spool or the paper roll wound on such reel-spool and is trained about part of the circumference of the paper roll or the reel-spool when empty.

4,143,829

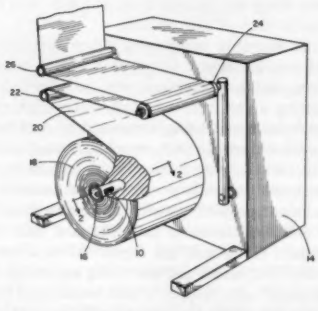
CORE CHUCK

John R. Martin, Rockford, Ill., assignor to Martin Automatic, Inc., Rockford, Ill.

Filed Feb. 27, 1978, Ser. No. 881,581

Int. Cl.[2] B65H *17/02*

U.S. Cl. 242—68.2 **6 Claims**



1. Apparatus for releasably securing a workpiece for rota-

tion in at least one rotational direction comprising, in combination:

a rotatable member having an axis of rotation and a surface with a slot defined therein;

a rigid member having an end and a pivotal axis; and

means for mounting said rigid member within said slot, with said pivotal axis substantially parallel to said axis of rotation, for pivotal movement about said pivotal axis between at least a first position and a second position;

said end in said first position of said rigid member co-operating with said rotatable member to wedge said workpiece;

said rigid member being pivotable between said first position and said second position by rotating said workpiece in relation to said rotatable member about said axis of rotation.

4,143,830

CORE SUPPORTS

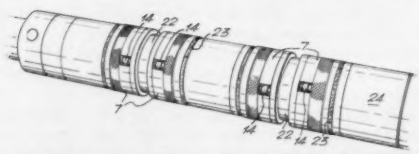
Anthony N. Dee, Kenwood Lee, Sheldon Ave., Highgate, London N.6, England

Filed Nov. 28, 1977, Ser. No. 855,349

Claims priority, application United Kingdom, Dec. 4, 1976, 50661/76

Int. Cl.[2] B65H *75/18*

U.S. Cl. 242—72 R **9 Claims**



1. In a core supporting device, the combination of an axially extending base member, a bore extending axially through the base member for receiving a shaft, at least one radially extending flange secured to the base member and provided with a cylindrical radially outer surface, a tubular sleeve mounted on the base member for rotation relative thereto and abutting said flange and substantially axially located with respect thereto, the sleeve having a radially outer cylindrical surface substantially contiguous with the radially outer surface of the said flange, a plurality of circumferentially spaced apertures in said sleeve, each such aperture having a given axial length less than the axial length of the sleeve and a given circumferential length, a plurality of circumferentially extending cam surfaces spaced about the circumferential surface of the base member radially inwardly of said apertures, and a plurality of roller members located one in each of said apertures and in cooperative relationship with an associated one of said cam surfaces, the axial length of said roller members being not greater than the axial length of the apertures and the diameter of the roller members being greater than said given circumferential length of the apertures, whereby each roller member has unrestrained radial movement within the limits determined by contact with its associated cam surface and its associated aperture and each roller member is constrained for movement with the sleeve upon relative rotation of the sleeve and base member.

4,143,831

SAFETY BELT RETRACTORS

Douglas J. Cunningham, Petersfield, and Ronald F. Tilley, Walberton, both of England, assignors to Britax (Wingard) Ltd., Great Britain

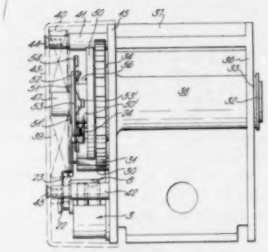
Filed Feb. 2, 1978, Ser. No. 874,604

Claims priority, application United Kingdom, Feb. 21, 1977, 7201/77

Int. Cl.[2] A62B *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.4 A **23 Claims**

1. A safety belt retractor comprising a belt storage shaft which is rotably mounted on a support, and locking means for said shaft mounted on said support; said locking means comprising an inertia sensitive mechanism including a plate-like mass in the form of a disc having a circular cross-section and a plate-like edge, a carrier which supports said disc on said plate-like edge, said disc being free to tilt about said edge and being free to move in another direction substantially parallel with said edge, said carrier limiting the tilting and the other movement of said disc so that it returns, by gravity, to a given rest position, a locking pawl, toothed means fast with said belt storage shaft, and a linkage responsive to said tilting and to said



other movement and to rotation of said shaft for causing said locking pawl to engage said toothed means for locking said shaft, said linkage including a first lever which is pivotally supported by the carrier, said first lever having first and second portions, said first portion contacting a periphery of the disc to sense its movement, and a second lever which is coupled between said locking pawl and said second portion of said first lever, said second lever being movable by said first lever into a position where it is responsive to rotation of said shaft to cause said locking pawl to engage said toothed means.

4,143,832

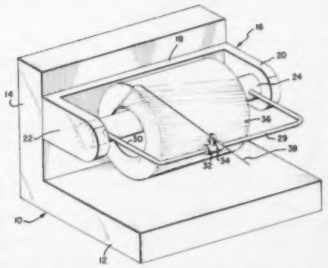
THREAD DISPENSER

Ellis F. Platt, 10555 W. Beaver St., Jacksonville, Fla. 32220

Filed May 19, 1977, Ser. No. 798,363

Int. Cl.[2] B65H *49/00*

U.S. Cl. 242—129.62 **10 Claims**



1. An improved dispenser for a strand, which strand has been twine-wound about a hollow spool to form a ball having a central hollow longitudinally therethrough, comprising:

a. ball mounting means for horizontally and rotatably mounting a spool of a ball of strand;

b. fairlead support means having a first elongated mounting stem portion having opposite end portions with one of said end portions being connected to said ball mounting means adjacent an end of a spool and the other of said end portions being located outwardly of said ball mounting means, said fairlead support means further having an elongated shaft portion connected at one end to said other end of said mounting stem portion and extending generally parallel to a ball, said shaft portion extending at least

substantially the length of a ball and terminating in another end;

c. said ball mounting means including means for mounting said fairlead support means on said ball mounting means for rotational movement about a ball;

d. fairlead means reciprocably and rotatably carried on said fairlead support shaft portion; and

e. said fairlead support means having stop means adjacent said other end of said fairlead support shaft portion engageable by said fairlead means for retaining said fairlead means being carried on said fairlead support shaft portion.

4,143,833

WIRE FORCING DEVICE FOR A WIRE TAKE UP APPARATUS

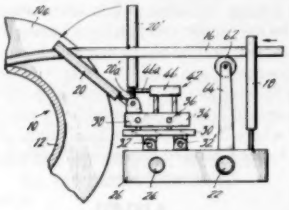
Ryoichi Hara, Chiba; Masamichi Yajima; Chiaki Akai, both of Ichihara, and Takuzo Matsumoto, Osaka, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo and Sumitomo Electric Industries, Inc., Osaka, both of, Japan

Division of Ser. No. 772,339, Feb. 25, 1977. This application Nov. 15, 1977, Ser. No. 851,629

Claims priority, application Japan, Feb. 25, 1976, 51-20521; Feb. 25, 1976, 51-20522

Int. Cl.[2] B65H *54/28*

U.S. Cl. 242—158 R **1 Claim**



1. A distributor for use with a take-up apparatus which winds wire onto a reel with flanges at each end, said distributor comprising:

a pair of pivotable guide rollers spaced from the longitudinal axis of said reel, at the pivot point thereof, a distance greater than the radius of said flanges, one roller on each side of said wire and said rollers being pivotable in a direction normal to the longitudinal axis of said reel into the space between said flanges;

carriage means carrying said pivotable guide rollers thereon for moving said guide rollers parallel to the longitudinal axis of said reel;

adjustment means connected to said pivotable guide rollers for selectively positioning one of said pivotable guide rollers inside the space between said flanges on said reel and the other of said rollers outside the space of said flanges on said reel; and

urging means connected to said carriage means for urging said pivotable guide roller positioned inside the space between said flanges against one of said flanges when said pivotable guide roller approaches said flange.

4,143,834

WIRE FORCING DEVICE FOR A WIRE TAKE UP APPARATUS

Ryoichi Hara, Chiba; Masamichi Yajima; Chiaki Akai, both of Ichihara, and Takuzo Matsumoto, Osaka, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo and Sumitomo Electric Industries, Ltd., Osaka, both of, Japan

Filed Feb. 25, 1977, Ser. No. 772,339

Claims priority, application Japan, Feb. 25, 1976, 51-20521; Feb. 25, 1976, 51-20522

Int. Cl.[2] B65H *54/28*

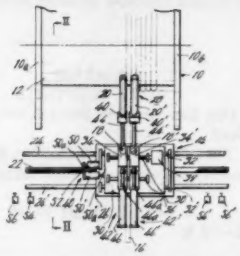
U.S. Cl. 242—158 R **2 Claims**

1. A distributor for use with a take-up apparatus which winds wire onto a reel with flanges at each end, said distributor comprising:

a pair of movable guide rollers adjacent said reel, one roller on each side of said wire and movable in a direction normal to the longitudinal axis of said reel;

stationary guide rollers adjacent said movable guide rollers on the side of said movable guide rollers opposite said reel, one roller on each side of said wire;

carriage means carrying said movable and stationary guide rollers thereon for moving said guide rollers parallel to the longitudinal axis of said reel;



adjustment means connected to said movable guide rollers for selectively positioning one of said movable guide rollers inside the space between said flanges on the reel and the other of said rollers outside the space of said flanges on said reel; and

urging means connected to said carriage means for urging said movable guide roller positioned inside the space between said flanges against one of said flanges when said movable guide roller approaches said flange.

4,143,835

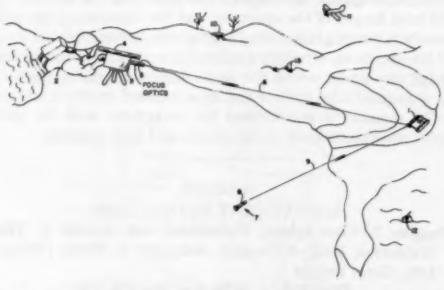
MISSILE SYSTEM USING LASER ILLUMINATOR

Walter B. Jennings, Jr.; William B. McKnight, and Richard D. Milton, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 288,455, Sep. 12, 1972, abandoned, which is a continuation of Ser. No. 871,746, Oct. 9, 1969, abandoned, which is a continuation of Ser. No. 516,160, Dec. 23, 1965, abandoned. This application Aug. 16, 1976, Ser. No. 714,452

Int. Cl.[2] F41G *7/14*; F42B *13/30, 15/10, 15/02*

U.S. Cl. 244—311 **5 Claims**



1. A method of operating a missile system having a laser illuminator for illuminating a target with laser beam and a guided missile with detector means capable of detecting reflected laser energy, and disposed for causing the missile to home on a target, the improvement comprising the steps of: discretely illuminating the target in a cluttered field of view with a collimated, coherent light beam of small cross sectional

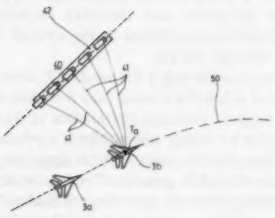
area with respect to the area of the target with laser illumination from the laser illuminator to provide reflection of said laser illumination from said target and in range of the guided missile; and homing the guided missile on said reflected laser illumination from the target for target interception and destruction.

4,143,836

METHOD AND DEVICE FOR SPREAD BOMBING

Ulrich Rieger, Westerham, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Fed. Rep. of Germany

Filed Aug. 25, 1976, Ser. No. 717,660
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1975, 2538665
Int. Cl.[2] F41G *7/10;* F42B *15/10, 15/02, 15/16*
U.S. Cl. 244—3.15 4 Claims



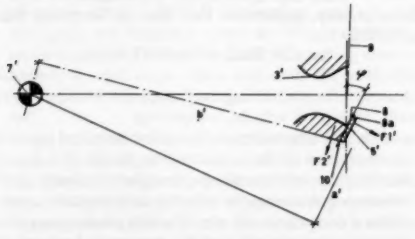
1. A method of spread bombing with bombs transported by a carrier aircraft near to a target area, wherein a plurality of guided bombs are provided with respective programmable storage devices; comprising the steps of providing a freely selectable target coverage pattern by supplying the storage devices with selected different respective guide programs which can be adjusted, both on the ground, prior to an attack on a target area, and in the carrier aircraft, during the attack, as a function of the steps of locating the target and determining the preselected target coverage pattern; simultaneously transforming the respective different guide programs into respective different guide commands and storing the guide commands in the respective storage devices of the individually guided bombs; the step of utilizing the stored guide commands to guide the respective bombs and responsive to simultaneous release of the bombs from the carrier aircraft, independently of each other into different respective trajectories so that the bombs strike the target area in a predetermined coverage density corresponding to the selected target coverage pattern.

4,143,837

CONTROL DEVICE FOR MISSILE OR THE LIKE

Carl H. G. Thunholm, Karlskoga, Sweden, assignor to AB Bofors, Bofors, Sweden

Filed May 19, 1977, Ser. No. 798,554
Claims priority, application Sweden, Jun. 8, 1976, 7606418
Int. Cl.[2] F42B *13/30;* F02K *1/20*
U.S. Cl. 244—3.22 7 Claims



1. A spoiler control assembly for deflecting a stream of propelling gas flowing through an exhaust nozzle of a motor powered missile type device, and comprising:

at least one spoiler blade having first and second respective end portions, said spoiler being positioned adjacent a rear end surface of said exhaust nozzle with said spoiler blade extending at a predetermined acute angle with respect to a plane passing directly through an opening in said exhaust nozzle;

a shaft for rotation about an axis extending axially therethrough and mounted within said missile device and inclined at a further acute angle to a center axis extending through said exhaust nozzle;

said shaft having an end portion directly attached to said first end portion of said spoiler blade for joint rotation therewith; and

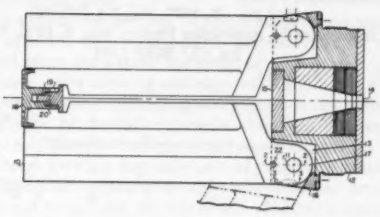
means for rotating said shaft and said spoiler to extend a portion of said spoiler into said stream of propelling gas causing deflection thereof.

4,143,838

FOLDING FIN ASSEMBLY DETENT

Samuel P. Holladay, Westlake Village, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 22, 1977, Ser. No. 826,280
Int. Cl.[2] F42B *13/32*
U.S. Cl. 244—3.28 6 Claims



1. A folding fin assembly for a missile comprising;

at least one pair of fins pivotally mounted on said assembly and movable between a retained position and a deployed position;

a hub portion on each fin of said at least one pair of fins;

a fin hinge pin included in said assembly and associated with each fin of said at least one pair of fins;

each fin being pivotally mounted on an associated fin hinge pin;

said at least one pair of fins being held in the deployed position by a double ball detent assembly;

a hole extending through each hub portion parallel to each fin hinge pin;

said double ball detent assembly being contained in the hole extending through the hub portion.

4,143,839

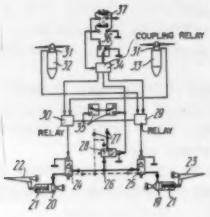
APPARATUS FOR COMBATING ROLLING MOVEMENTS OF AIRCRAFT

Oleg K. Antonov, ulitsa Ogareva, 1; Valentin T. Maslov, ulitsa Nevskaya, 7a, kv. 1, and Alexei F. Voitko, ulitsa Deputatskaya, 7, kv. 43, all of Kiev, U.S.S.R.

Filed Aug. 29, 1977, Ser. No. 828,765
Int. Cl.[2] B64C *13/16*
U.S. Cl. 244—76 R 5 Claims

1. An apparatus for combating the rolling movements of an aircraft with an even number of propulsion units when one of the propulsion units fails to operate due to a breakdown, comprising: propulsion unit failure detectors; a power circuit incorporating an energy source, control valves and control surface actuators; spoilers mounted on outboard wings of said aircraft and having individually actuated drives connected to said

power circuit via one of said control valves which, in turn is functionally associated with a respective failure detector of the propulsion unit disposed on the outboard wing opposite to that



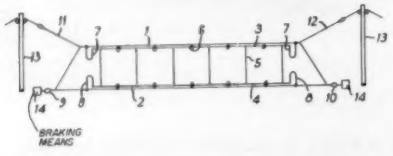
mounting said spoiler; an interlocking valve through which said power circuit is connected to said energy source; and a takeoff sensing means functionally associated with said interlocking valve to actuate it.

4,143,840

ARRESTER NET GEAR FOR AIRCRAFT

Jean P. Bernard, Paris, and Paul A. Meningand, Clamart, both of France, assignors to Aerazur Constructions Aeronautiques, Moulineaux, France

Filed Jul. 25, 1977, Ser. No. 818,902
Claims priority, application France, Aug. 5, 1976, 76 23917
Int. Cl.[2] B64F *1/02*
U.S. Cl. 244—110 C **2 Claims**



1. An aircraft arrester net gear comprising:

(i) a supporting frame consisting of

an upper horizontal strap connected at its ends to posts for raising the net and to braking means,

a lower horizontal strap connected at its ends to said braking means,

(ii) at least one elementary net slidingly mounted on said supporting frame, said at least one elementary net comprising:

an upper horizontal strap having slack at both ends,

a lower horizontal strap having slack at both ends,

vertical straps connecting said horizontal upper and lower straps of said at least one elementary net,

(iii) unbreakable connecting means rigid with the upper horizontal strap of the frame and presenting loops in which can slide the upper horizontal strap of the at least one elementary net,

unbreakable connecting means rigid with the lower horizontal strap of the frame and presenting loops in which can slide the lower horizontal strap of the at least one elementary net,

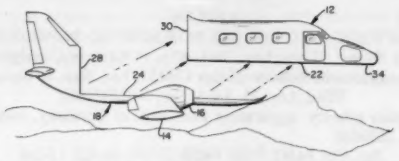
whereby when the arrester net gear is engaged by an aircraft said at least one elementary net can slide laterally, the vertical straps forming a net mesh and being brought nearer together by engagement with the aircraft thus permitting a greater spacing between the vertical straps of the net, and the whole arrester net gear following the aircraft and thus actuating the braking means through the upper horizontal strap of the frame as well as through the lower horizontal strap of the frame.

4,143,841

AIRCRAFT BREAKAWAY CABIN SECTION

George K. Roeder, P.O. Box 4335, Odessa, Tex. 79760

Filed Jul. 11, 1977, Ser. No. 814,395
Int. Cl.[2] B64D *25/12*
U.S. Cl. 244—140 **4 Claims**



1. An aircraft having a cabin section affixed to a main support structure; a wing and an empennage supported by said main support structure, and thrusters including means by which said thrusters are affixed to the aircraft for propelling said aircraft through the air;

said cabin section having a forward end, a rear end, a deck, a roof, and sidewalls joining said roof and deck together;

said main support structure terminates upwardly in a platform, means by which said platform is releasably joined to said deck so that the main support structure and the cabin section are mated to present a fuselage suitable for propagation through the air, and wherein said cabin section can be separated from the remainder of the aircraft by moving the cabin section forwardly in a substantially horizontal direction respective to the main support structure;

said means by which said platform is releasably joined to said deck includes a first and second group of fastener means, said first group of fastener means comprising a plurality of shear bolts, said second group of fastener means comprising a plurality of remotely actuated fasteners which are placed to releasably join said deck and platform together; said second group of fastener means being exlosive bolts having detonators, remote means for activating said detonators so that said second group of fastener means may be unfastened, thereby leaving the cabin section attached to the main support structure by said shear bolts which will shear only when the support structure is suddenly arrested by impact, the first group of fastener means being sheared upon impact of the support structure to enable the cabin section to continue to move in a forward direction respective to the main support structure, thereby separating the cabin section from the remainder of the aircraft.

4,143,842

BRAKE CONTROL DEVICE TAKING INTO ACCOUNT DIFFERENT BRAKE ACTIVATING TIMES

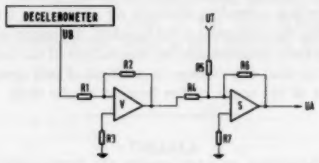
Helmut Übel, Stuttgart, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Sep. 2, 1977, Ser. No. 830,375
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1976, 2639950
Int. Cl.[2] B61L *3/00*; B60T *8/02*
U.S. Cl. 246—182 B **6 Claims**

1. A device for controlling the brakes of a trackbound automatically controlled vehicle, comprising:

control means adapted to receive a first electrical signal, U_B, representative of the instantaneous change in velocity of the vehicle to increase the deceleration as a function of the instantaneous change in velocity, said control means includes a control circuit means which produces an electrical signal representative of the automatic brake application curves which is proportional to the term Te

[1 −(B/Bmax), where Te is a dead time corresponding to the maximum brake activating time, B is the instantaneous

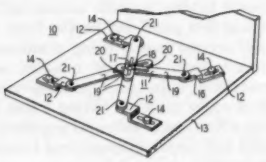


effective deceleration, and Bmax is the maximum possible deceleration.

4,143,843
ALIGNING KIT

Henry Ehrens, Bayside, N.Y.; Charles W. Slocum, Spring Lake Heights, N.J.; Anthony Mancuso, Brick Township, Bergen County, N.J., and Sidney Weiner, Cresskill, N.J., assignors to Sealed Unit Parts Co., Inc., Allenwood, N.J.

Filed Feb. 28, 1977, Ser. No. 772,427
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—544 **9 Claims**



1. In an assembly adapted to facilitate the joining of a plurality of first article mounting means located on a replacement unit to a corresponding plurality of first support mounting means located on a base, the combination comprising:

a plurality of individual brackets for interfacing between said first article mounting means and said first support mounting means wherein each bracket is an elongated flat strip having a substantially "Z" shaped configuration and includes a second article mounting means on one end for engaging a first article mounting means and a second support mounting means on the other end for engaging a first support mounting means;

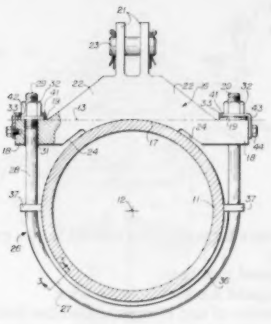
a template comprising a pivot pin, a plurality of elongated arms wherein each arm includes locating means for adjustably positioning said arm on said pivot pin so that said pivot pin extends through the locating means in each of said arms, and indexing means for recording the spacial relationship of all of said first article mounting means with respect to each other when said arms are moved to selected positions on said pivot pin and rigidly held in place; and

enabling means for locking together said first and second support mounting means when said second article mounting means are aligned in coincidence with said indexing means whereby each first article mounting means on said replacement article will be in identical spacial relationship with a corresponding second article mounting means fastened to said base.

4,143,844
PIPE CLAMP

William Van Meter, 415 Perkins St., Oakland, Calif. 94610

Filed Jul. 7, 1977, Ser. No. 813,489
Int. Cl.[2] F16L *3/10*
U.S. Cl. 248—62 **3 Claims**



1. A pipe adapted to be subjected to varying temperatures having a substantially cylindrical exterior and having a longitudinal axis and a horizontal neutral plane tangent to the top of the exterior of said pipe,

and a pipe clamp for said pipe to tightly support said pipe in two opposite support directions perpendicular to said neutral plane throughout the range of said varying temperatures while allowing said pipe free thermal diametric expansion without restraining said expansion and without occurrence of thermal expansion constraint stresses in either said clamp or said pipe, said clamp comprising

a yoke beam having a deep section at its midpoint extending in a direction transverse to and away from said neutral plane and to said axis, the top of said yoke beam tapering downwardly-outwardly from the middle of said yoke beam to the outer ends of said yoke beam, said outer ends being formed with apertures perpendicular to said neutral plane, said yoke beam having a concave undersurface comprising a contact surface in contact with said pipe at the middle of said yoke beam, said contact surface being substantially complementary to the exterior of said pipe and engaging said pipe at said neutral plane at the top of said pipe and for a short distance laterally of said yoke beam to either side of said middle limited by lower beam reliefs,

said yoke beam having a depth substantially greater than the width of said yoke beam at said contact surface, said yoke beam comprising a tapered offset beam for moment stress distribution,

said outer ends being located below said neutral plane and having top surfaces on said neutral plane,

said yoke beam having support means extending from its top upward away from said neutral plane for attachment to a seismic snubber or a stationary support,

a rigid U-shaped clamp bar having a curved portion in thermal transfer relation with the bottom of said pipe remote from said neutral plane and straight portions extending upward on either side of said pipe and through said apertures, the termini of said straight portions being threaded,

said pipe and said clamp bar having substantially the same thermal coefficients of expansion,

and nuts threaded on said termini of said straight portions applying pressure on said yoke beam at said neutral plane,

said clamp bar having free thermal expansion from said top surface of said outer ends equal to the thermal diametric expansion of said pipe.

4,143,845

DETACHABLE SUPPORT MEMBERS

Mary A. Harris, 6443 Leighton, Lincoln, Nebr. 68507

Filed Jan. 3, 1978, Ser. No. 866,506
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—221.2 **12 Claims**

1. Apparatus for supporting articles from a perforated board, comprising:

an elongated member;

said elongated member being a wire;

a first portion of said elongated member being adapted to be fastened to the back of said perforated board at a selected first opening in said perforated board;

a second portion of said elongated member at an angle to said first portion being adapted to pass through a second opening in said perforated board;

a third portion of said elongated member forming a support structure, whereby articles may be supported on said board; and

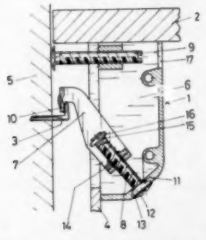
one end of said first portion of said elongated member having internal walls therein forming a tapped hole, whereby said one end may be fastened to the back of the perforated board with a screw.

4,143,846

ADJUSTABLE BRACKET FOR WALL-UNITS

Erich Rock, Hochst, and Bernhard Mages, Dornbirn, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Hochst, Austria

Filed May 5, 1977, Ser. No. 794,229
Claims priority, application Austria, May 13, 1976, 3525/76
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—360 **8 Claims**



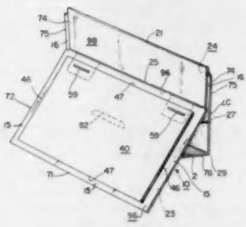
1. An adjustable bracket for wall units having a casing fastenable to the interior of a piece of furniture comprising: a bracket element adjustably anchored to an interior of a piece of furniture; a mounting panel; a wall hook fixed to said mounting panel; adjusting means; said bracket element being hangable on said wall hook and being held in said casing by said adjusting means; said bracket element being pivotally mounted in said casing; said bracket element having a center of rotation; said casing hanging on said bracket element at said center of rotation of said bracket element; said casing having screw seat means; said adjusting means comprising an adjusting screw with head in said screw seat means in said casing, said head having a convex support on a side of said casing, said convex support conforming to said screw seat means for said adjusting screw in said casing; a spacer in form of a thread bolt, said spacer being mounted in a second screw seat means in said casing and abutting against said mounting panel, said spacer and said bracket extending through an opening in a rear plane of said casing for concealing the bracket, the piece of furniture being accurately positionable by interaction of the bracket and said spacer so that any change in position of said spacer results in a change of the angle of the bracket to the wall.

4,143,847

SNAP LOCKING, SLANT DISPLAY SUPPORT EASEL AND METHOD OF MAKING THE SAME

Carroll N. Cross, Rte. 2, Box 741, Maitland, Fla. 32751

Filed Jan. 28, 1977, Ser. No. 763,512
Int. Cl.[2] A47B *97/04*
U.S. Cl. 248—459 **10 Claims**



1. A foldable easel-type mount comprising in combination:

a first panel having a width and front and rear faces,

a second panel having a width substantially equal to the width of said first panel and having front and rear faces,

said first and second panels being positionable in parallel planar face-to-face, flattened relation, said first panel being bendable at a first selected transverse hinge area to form a first upper subpanel having a first upper subpanel length and a first lower subpanel angularly disposed relative to said first upper subpanel and having a first lower subpanel length,

said second panel being bendable at a second selected transverse area to form a second upper subpanel having a second upper subpanel length,

and a lower subpanel having a second lower subpanel length and being angularly disposed relative to said second upper subpanel,

means to hold said first and second upper subpanels in substantially fixed parallel planar-contacting face-to-face relation with their contacting faces being substantially unattached throughout most of the lengths thereof,

a first positioning means formed on said first lower subpanel, and

a second mating positioning means formed on said second lower subpanel,

said first and second positioning means being adatped upon mating to hold said first and second lower subpanels substantially fixedly angularly relative to each other, and wherein said second upper subpanel has at least one bendable tongue substantially score-cut from said subpanel except at a transverse upper edge thereof, said tongue being adapted to form a portion of said holding means.

4,143,848

ART OBJECT ADJUSTABLE MOUNTING ASSEMBLY

John W. Slemmons, 19142 Glenn Albyn, Orange, Calif. 92669

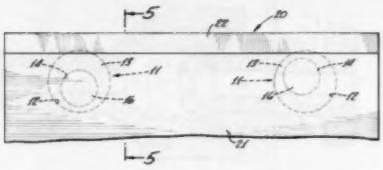
Filed Jan. 10, 1977, Ser. No. 757,821
Int. Cl.[2] A47G *1/16*
U.S. Cl. 248—489 **10 Claims**

1. Mounting means for supporting posters, pictures, and other art objects on a vertical surface, comprising:

a post;

means for securing one end of said post to said vertical surface; and

a thin disc having an off-center hole therein, the diameter and cross-sectional shape of said hole in said disc being approximately the same as the diameter and cross-sectional shape of said post, said post extending through said hole in said disc, the edge of said disc defining said hole engaging the side of said post in a manner which inhibits undesired rotation of said disc relative to said post, said disc being adapted to support an art object on the uppermost edge thereof, whereby rotation of said disc relative to said post raises or lowers said art object.



4,143,849

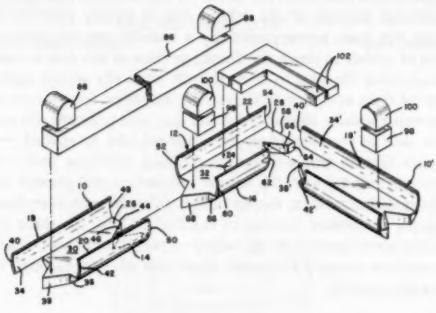
MOLD FOR FORMING JOINTS BETWEEN CONDUITS

Gary L. Good, 117 E. Maple St., Cleona, Pa. 17042

Filed Feb. 1, 1978, Ser. No. 874,254

Int. Cl.[2] B28B *7/28*

U.S. Cl. 249—11 **10 Claims**



1. A mold for forming a molded joint between ends of pairs of pipes, said mold comprising a pair of mold parts each having a channel shaped transverse cross section with a partial cylindrical outer surface, flexible upstanding side walls and a bottom section joining the side walls; a first pair of alignment members comprising a first alignment member at one end of a first mold part and a second alignment member at one end of the other mold part, the alignment members each including interengagable mold part orienting surfaces such that when the orienting surfaces are brought together the mold parts are joined together at a first angular orientation with the side walls and bottom sections thereof joining each other to form a continuous mold; and a second pair of alignment members comprising a third alignment member at the other end of said first mold part and a fourth alignment member at the other end of said other mold part, said third and fourth alignment members each including interengagable mold part orienting surfaces such that when such orienting surfaces of the third and fourth alignment members are brought together the mold parts are aligned at a second angular orientation with the side walls and bottom sections thereof joining each other to form a second mold for forming a joint between pipes at a second angular orientation.

4,143,850

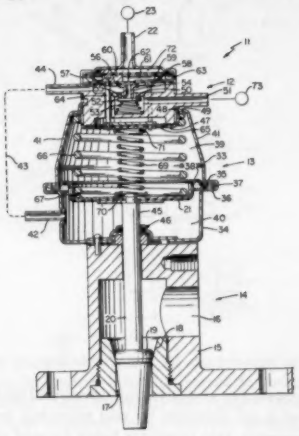
PILOT OPERATED VALVE POSITIONER

Harold G. Brakebill, Concord, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed May 25, 1977, Ser. No. 800,299

Int. Cl.[2] F16K *31/12*; F15B *13/16*

U.S. Cl. 251—28 **5 Claims**



1. In a pilot operated valve positioner having pilot valve means operated by a pneumatic signal to pneumatically operate an actuator means carrying a main valve member to position the same relative to its main valve seat in a valve unit in relation to the magnitude of said pneumatic signal, said actuator means having a range spring and a feedback spring for said pilot valve means, said springs being coiled compression springs and being substantially concentrically mounted, the improvement wherein said pilot valve means has a positioning diaphragm means that is substantially concentrically disposed in one end of said range spring of said actuator means and said pilot valve means has a housing means that is also partially concentrically disposed in said one end of said range spring of said actuator means to render said valve positioner relatively small and compact, said housing means carrying a second flexible diaphragm means that is exposed to said pneumatic signal, said housing means carrying a third flexible diaphragm means that separates said positioning diaphragm means thereof from said second diaphragm means, said housing means carrying valve means intermediate said third diaphragm means and said positioning diaphragm means to be operated by said third diaphragm means for directing another pneumatic source to said actuator means to pneumatically operate the same.

4,143,851

GAS-OIL DRIVE FOR FORWARD AND REVERSE MECHANICAL ADJUSTING MOVEMENTS

Bernd Lange, Berlin, Fed. Rep. of Germany, assignor to Borsig Gesellschaft mit beschrankter Haftung, Berlin, Fed. Rep. of Germany

Filed Nov. 1, 1977, Ser. No. 847,587

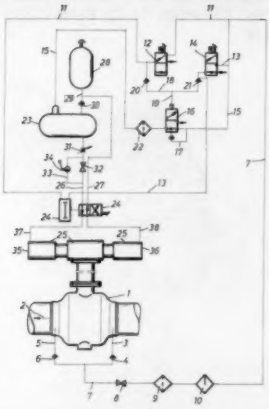
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1976, 2650802

Int. Cl.[2] F16K *31/42*

U.S. Cl. 251—29 **9 Claims**

1. Gas-oil drive for forward and reverse adjusting movements for controlling valve means, located in a gas conduit for controlling the flow of said gas therethrough, which comprises: a pressure tank associated with said gas-oil drive and adapted to receive control oil; means for conveying gas from said gas conduit at a pressure greater than atmospheric pressure to said pressure tank so as to convey said gas pressure to control oil contained in said pressure tank; an adjusting device,

connected to said pressure tank and adapted to receive therefrom control oil under pressure, for effecting the control of said valve means in said gas conduit, said adjusting device also being adapted to expel control oil; and an unpressurized con-



tainer connected to said adjusting device and said pressure tank for receiving oil, expelled by said adjusting device at atmospheric pressure, said container being located above the level of said pressure tank.

4,143,852

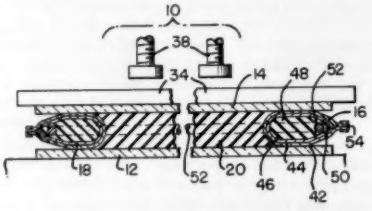
REUSABLE GASKET FOR USE IN AND IN COMBINATION WITH A MOLDING APPARATUS

Robert Wiener, 3985 Goveneur Ave., New York, N.Y. 10463

Filed Jan. 7, 1976, Ser. No. 647,188

Int. Cl.[2] B29C *1/04*

U.S. Cl. 249—135 **10 Claims**



1. A reusable gasket for use between a pair of glass plates or like members of a static molding apparatus to seal an edge of a cavity in the molding apparatus in which a plastic sheet may be cast, said gasket comprising mold release means providing external surface portions which in use may be in sealing engagement with mold members, also be in contact with a plastic sheet to be cast, and be effective as a natural ground with respect to static electricity between the glass plates or like members, whereby personnel will not be subjected to shock from static electricity and the glass plates or like members may be readily separated to obtain access to the finished product, and a core member of elastomeric material enclosed within said mold release means, wherein said external surface portions of said mold release means is of silver material and will not adhere to and will freely separate from a plastic article to be cast and from the plate or like members for defining the walls of a molding apparatus in which such an article may be cast, wherein said gasket includes an inner layer of backing material and said mold release means which is of silver material is adhered on said backing material externally thereof.

4,143,853

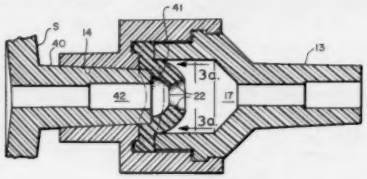
VALVE FOR USE WITH A CATHETER OR THE LIKE

Harvey J. Abramson, New York, N.Y., assignor to Metatech Corporation, Northbrook, Ill.

Filed Jul. 14, 1977, Ser. No. 815,598

Int. Cl.[2] F16K *37/28*

U.S. Cl. 251—149.1 **5 Claims**



2. A miniature valve for use with a catheter or the like comprising a cylindrical valve body made up of a cylindrical male member and a cylindrical female member telescoped together, the members having respective internal annular seats opposed to one another and surrounding a central through-opening, the valve body having leur-type tapered male and female connections at the respective ends communicating with the through-opening, a disc of soft rubber having a diameter which snugly fills the space between the seats, the disc having a central domed portion of shallow dome shape and with a central axial slit, the axial dimension of the peripheral portion of the disc in the relaxed state being substantially greater than the average thickness of the domed portion, the male and female members having axially interengaging detent elements so positioned that when the members are detented together the peripheral portion of the rubber disc is tightly pinched between the seats accompanied by a radially inward displacement of rubber to stress the domed portion of the disc in radial compression thereby to keep the slit normally sealed against flow of fluid in either direction, the leur-type female connection being axially aligned with the disc and adjacent the concave side of the domed portion thereof and so spaced with respect thereto that when a cooperating leur-type male connector is inserted into the female connection and pressed into tight seated condition, the tip of the male connection sealingly engages the domed portion of the disc to bow the same outwardly accompanied by spreading of the slit but short of axial penetration thereby to permit axial flow of fluid through the through-opening.

4,143,854

JACKING DEVICE

Manfred Vetter, D-5352 Zuelpich, Burg Langendorf, Fed. Rep. of Germany

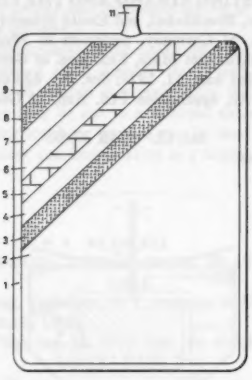
Continuation of Ser. No. 574,871, May 6, 1975, abandoned. This application Jul. 25, 1977, Ser. No. 818,661

Int. Cl.[2] B66F *3/24*

U.S. Cl. 254—93 HP **20 Claims**

1. A fluid jacking device comprising a multiwall pressure and fluid-tight envelope provided with metal wire containing fabric reinforcements and enclosing a volume which changes when the internal pressure is varied, and a connector fitted into the envelope for joining its interior to a pressure supply, said envelope consisting of at least one pair of panels made of at least five plies of flexible high strength material, such said ply

being composed of one of neoprene, fabric and rubber, said panels of each pair being integrally joined together at least at



one edge by lapping the plies at the juncture of said panels with at least one reinforcing strip applied to the joint.

4,143,855

WINCH

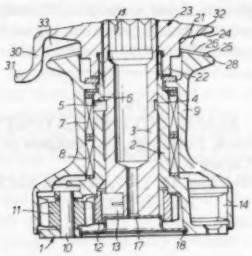
John D. Burton, Catherington, and Richard D. J. Huggett, Horndean, both of England, assignors to Lewmar Marine Limited, Hampshire, England

Filed May 16, 1977, Ser. No. 797,251

Claims priority, application United Kingdom, Sep. 8, 1976, 37280/76

Int. Cl.² B66D *1/30*

U.S. Cl. 254—150 R **10 Claims**



1. In a self tailing winch having two jaws defining a self-tailing channel adjacent a rotatable winch drum, stationary means for guiding a line from said drum to said channel, and a stationary stripper tongue projecting into said channel to strip the line therefrom, the improvement comprising means for constraining one of said jaws to be stationary and means for constraining the other of the jaws to rotate with the winch drum.

4,143,856

SPLIT DRIVE SYSTEM FOR DRAGLINE WITH POWER INTERLOCK

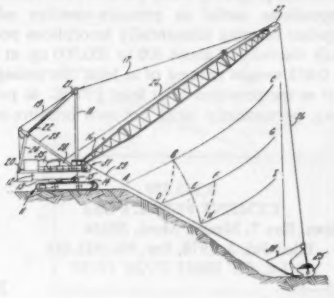
James G. Morrow, Sr., Manitowoc, Wis., assignor to The Manitowoc Company, Inc., Manitowoc, Wis.

Filed Sep. 23, 1977, Ser. No. 835,871

Int. Cl.² B66D *1/26*

U.S. Cl. 254—185 R **6 Claims**

1. A split drive system for a dragline having a hoist drum and a drag drum comprising, in combination, a power source, means including a first torque converter having an output shaft and a first selectively engageable clutch for interconnecting said power source and said hoist drum, means including a second torque converter having an output shaft and a second selectively engageable clutch for interconnecting said power source and said drag drum, drum interlock means for selectively coupling said drums together, hoist control means movable in one directon for engaging said first clutch and for modulating said first torque converter, said hoist control means being movable in the opposite direction for engaging said drum interlock means, drag control means movable in one direction



for engaging said second clutch and for modulating said second torque converter, power interlock means for selectively coupling said output shafts together, and control means for engaging said power interlock means and for automatically rendering said drag control means operative when moved in said one direction for selectively modulating both of said first and second torque converters.

4,143,857

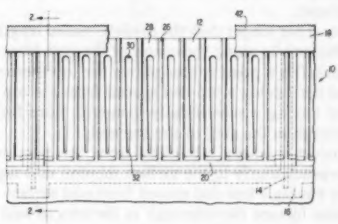
SAFETY/PRIVACY FENCE

Robert I. Weiner, 4 Chartwell Ct., Owings Mills, Md. 21117

Filed Apr. 14, 1977, Ser. No. 787,585

Int. Cl.² E04H *17/00*

U.S. Cl. 256—11 **14 Claims**



1. A fence construction, comprising:

a plurality of panels each having alternate rib sections and recessed sections, at least certain of said sections each having a vertically elongated opening defined by downwardly converging sides connected at their upper ends by a large radius and at their lower ends by a small radius, the width of the lower end of said opening and the angle of convergence of the sides thereof being such as not to provide a hand or foot hold for a child;

a plurality of support posts;

connecting means for securing said panels to said posts; and

a fence cap member having a continuous, downwardly opening channel adapted to fit securely along the upper edge of each said panel along the length thereof.

4,143,858

SUBSTANTIALLY AMORPHOUS POLYOLEFINS USEFUL AS PRESSURE-SENSITIVE ADHESIVES

Robert R. Schmidt, III, and Jerry D. Holmes, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,575
Int. Cl.[2] C08F 8/00, 8/50, 8/42
U.S. Cl. 526—48.2 4 Claims

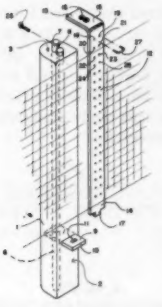
1. A process for preparing tacky modified amorphous polyolefin compositions useful as pressure-sensitive adhesives which comprises reacting substantially amorphous polyolefin having a melt viscosity of about 100 to 200,000 cp. at 190° C. with about 0.075 weight percent of at least one strong Lewis acid catalyst at temperatures of at least 250° C. to provide a low viscosity, permanently tacky hot-melt pressure-sensitive adhesive.

4,143,859

CEMENT FENCE POST

Ricky R. Tews, Box 7, Moore, Mont. 59464

Filed Jul. 3, 1978, Ser. No. 921,191
Int. Cl.[2] E04H 17/20, 17/10
U.S. Cl. 256—49 2 Claims



1. A cement fence post, comprising

a cement post having a predetermined length, a length-extending surface, a top and a spaced opposite bottom, said post being embedded for part of its length in the ground;

a central bar longer than the predetermined length extending substantially along the center of the post from the bottom thereof to a point spaced above the top thereof, said central bar having a top end spaced from the top of the post and having a substantially diametric bore formed therethrough in the area of the top end;

a support member extending from the post substantially perpendicularly to the surface thereof, said support member having a free end spaced from said surface and having a slot formed therethrough in the area of said free end;

an elongated flat fence bar having spaced opposite first and second ends, said fence bar being bent at right angles to itself in the area of its first end to form a top part covering the top of the post, said top part having a hole formed therethrough for accommodating the top end of the central bar and having a projecting tongue at its second end fitting into the slot through the support member when said fence bar is mounted on the post with the central bar extending through the hole through the top part thereof, said fence bar having a plurality of pairs of bores formed therethrough at equally spaced distances along the length thereof;

a cotter pin passing through the bore through the top end of the central bar to releasably secure the fence bar to said fence post; and

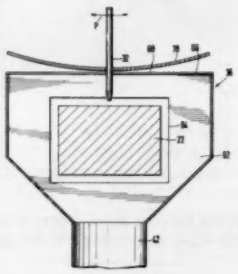
a plurality of fence stays for securing a wire fence to the fence bar via the pairs of bores of said fence bar.

4,143,860

FLAME CUTTING MACHINE FOR CONTINUOUS CASTING STRAND AND THE LIKE

Klaus Herbener, Bruchkobel, and Ewald Schmitt, Maintal, both of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 11, 1977, Ser. No. 823,615
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1976, 2639437
Int. Cl.[2] B23K 37/00
U.S. Cl. 266—49 9 Claims



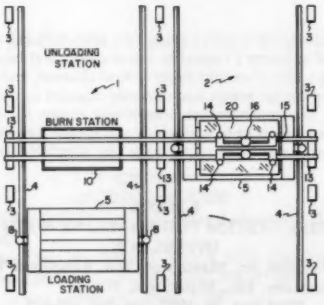
1. In a flame cutting machine having a cutting torch for subdividing continuously prepared casting strands with an arrangement including a suction head for removal of smoke gases, slag and the like produced during the cutting process, the improvement being said suction head and said cutting torch being mounted for joint movement together, said suction head including a housing having plurality of walls and end faces, said end faces being open to permit the casting strand to pass longitudinally through said housing, said walls of said housing defining a cutting zone therebetween, said cutting torch extending through one of said walls of said housing and into said cutting zone, and said housing surrounding said cutting zone to completely envelop the casting strand in said cutting zone.

4,143,861

FLAME CUTTING LAYOUT

Harry E. Anderson, Pittsburgh, Pa., assignor to Anderson Engineers, Inc., Carnegie, Pa.

Filed Aug. 15, 1977, Ser. No. 824,639
Int. Cl.[2] B23K 7/10
U.S. Cl. 266—49 3 Claims



1. A flame cutting layout comprising:

(a) at least two parallel processing lines having generally adjacent burn stations;

(b) each processing line having traveling support frames moveable parallel to the processing line, said support frames being adapted to receive a workpiece and to move the workpiece to the burn station;

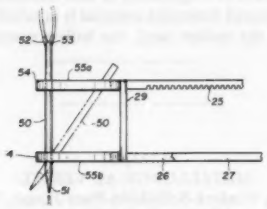
(c) a stationary bridge spanning at least two burn stations;
(d) at least one cutting torch guided and supported by the stationary bridge and moveable above at least two adjacent burn stations;
(e) means for simultaneously controlling both the longitudinal movement of a support frame and the transverse movement of a torch at a given burn station such that a workpiece may be cut to a selected shape and whereby said cutting torch or torches can be used at at least two burn stations, one burn station at a time.

4,143,862

APPARATUS FOR CUTTING PIPES, PLATES AND THE LIKE

Adrian H. Krieg, Yorktown, N.Y., assignor to Widder Corporation, Naugatuck, Conn.

Filed Sep. 18, 1975, Ser. No. 614,431
Int. Cl.[2] B23R *7/04*
U.S. Cl. 266—56 **10 Claims**



1. Apparatus for cutting, welding or otherwise working pipe, sheet, plate or similar work pieces comprising a carriage movable in a first axis parallel to the surface of said workpiece, an elongated bracket mounted on said carriage for reciprocal movement in a second axis angular to the first axis and parallel to the surface of said workpiece, a tool having a longitudinal axis, means for mounting said tool on said bracket relative to a third axis distinct from the longitudinal axis of the tool, said third axis being perpendicular to both the first and second axes and angular with respect to the surface of said workpiece, said means for mounting said tool holding said tool at two points spaced along the longitudinal axis of said tool and being adjustable at each of said points to selectively vary the position of the longitudinal axis in a plurality of linear directions with the holding points lying on an imaginary cylinder concentric with the third axis, and means for simultaneously controlling in response to a predetermined program the path of movement respectively for each of said carriage and bracket in each of said first and second axes and the adjustment of the means for mounting said tool to thereby continuously cause said tool to work said workpiece along a combined selected path at selected angles to the surface.

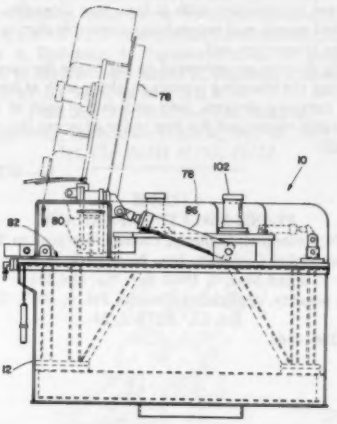
4,143,863

LIFT TOP QUENCH HARDENING PRESS

Kenneth D. Gladden, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 6, 1977, Ser. No. 830,544
Int. Cl.[2] C21D *9/32*
U.S. Cl. 266—118 **13 Claims**

1. A lift top quench hardening press, comprising:
a frame;
a horizontal die supported by said frame;
a lower die supported by said frame;
means for controllably lifting said horizontal and lower dies;
an upper die supported by said frame;
means for moving said upper die between a generally horizontal position adjacent said lower and horizontal dies and



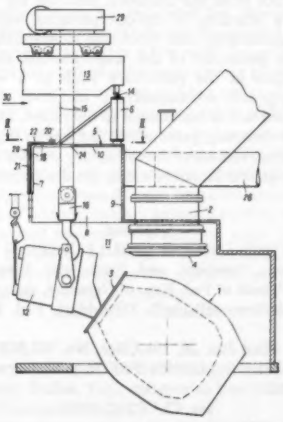
defining a quench zone therewith and a position transversly spaced from said quench zone; and
means for delivering fluid to said quench zone.

4,143,864

HOOD ARRANGED ON A BLOWING STAND COMPRISING A TILTABLE CONVERTER

Friedrich Laimer, Perg, and Herbert Herrmann, Linz, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Jan. 23, 1978, Ser. No. 871,501
Claims priority, application Austria, Feb. 4, 1977, 717/77
Int. Cl.[2] C21C *5/38*
U.S. Cl. 266—158 **13 Claims**



1. In a hood to be used for diverting smoke and flue gas emerging during charging of a tiltable converter of a steel making plant with a charging material, the steel making plant including a blowing stand for the tiltable converter, a crane arranged above the converter, and a charging container movable by said crane, the tiltable converter having a mouth and being tilted when in an inclined charging position while the charging material is poured from the charging container into the tiltable converter, the improvement characterized in that:
said hood is arranged to totally cover said mouth of said tiltable converter when the converter is in the charging

position, said hood being at such a vertical distance thereabove that free space for the charging container is created within the hood adjacent the mouth of the converter;

said hood is provided with at least one closeable, laterally located recess, said recess being closeable during charging of the converter; and

carrying devices are mounted on the crane for carrying and moving the charging container, along with at least part of said carrying devices, into and out of said at least one closeable recess and the free space adjacent the converter mouth.

4,143,865

FLASH SMELTING FURNACE

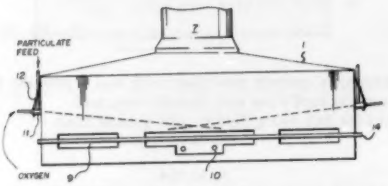
Thomas N. Antonioni, Sudbury, Canada, assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Mar. 7, 1978, Ser. No. 884,231

Claims priority, application Canada, Jul. 4, 1977, 281906

Int. Cl.² F27B *3/24*

U.S. Cl. 266—161 **7 Claims**



1. A flash smelting furnace having a refractory lining which defines a chamber within which, in operation, autogenous smelting takes place and a pool of molten matte and supernatant slag are contained, an outer metallic shell which encloses the lining, a plurality of burners extending generally horizontally from the exterior of the furnace to the chamber through apertures in the shell and lining, and an offtake aperture in the roof of the shell and lining through which, in operation, exhaust gases exit from the chamber, wherein the shell is provided with a plurality of cut-out portions which together define a discontinuous slot extending substantially along the whole of the perimeter of the walls thereof, to expose the external surface of the refractory walls at a vertical level which corresponds substantially to the level at which the matte-slag interface is maintained in operation, and means are provided for directing gaseous cooling jets to impinge on the exposed external surface of the refractory walls at a plurality of horizontally spaced locations along the discontinuous slot.

4,143,866

DEOXIDIZING AND/OR DESULFURIZING OF STEEL

Hans Schrewe, Duisburg, and Fritz-Peter Pleschiutschnigg, Düsseldorf, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Jan. 28, 1977, Ser. No. 763,562

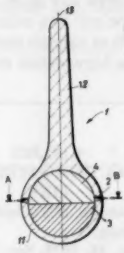
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1976, 2604296

Int. Cl.² C21C *7/00*

U.S. Cl. 266—216 **6 Claims**

1. A device for treating molten steel comprising:

a hollow, floatation body for free floating without external attachment and made of refractory material and containing ballast weight means in the lower portion of the hollow body sufficient to maintain the body submerged in molten steel and sufficiently low to maintain the body in an upright disposition, said hollow body further containing solid treatment material for treating the steel, the treatment material being disposed above the ballast weight means, the body as filled with said materials will initially be at least almost completely submerged, the body being constructed to have openings disposed near a boundary between the material and the ballast weight means, there being no openings near a top portion of the hollow interior, the openings being oriented to an axis of the body with a tangential component so that the openings



will undergo rotation when the body is submerged in steel and pursuant to evaporation of said treatment material as the evaporated treatment material is injected by the openings into the molten steel, the ballast material does discharge.

4,143,867

METALLURGICAL VESSEL

Walter Hoppe, Windeck-Schladern; Hans Jünger, Troisdorf, and Franz Weissenfels, Siegburg, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Division of Ser. No. 546,832, Feb. 3, 1975, Pat. No. 4,036,798. This application Mar. 29, 1977, Ser. No. 782,466

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1974, 2406992

Int. Cl.² C21B *7/12*

U.S. Cl. 266—272 **3 Claims**

1. A metallurgical vessel for carrying out a metallurgical refining process, said vessel having a tap hole accommodated by a plug, said plug comprising a hardened composition consisting essentially of an inorganic oxidic material other than glass powder and 5 to 30 weight percent of glass powder having a particle size of >0 to 100 microns and 1 to 20 weight percent of a hardenable thermo- or cold-setting phenolic resin, the weights being on the basis of the weight of the inorganic oxidic material.

4,143,868

CENTERING PIN FOR AIR FLOAT MACHINE TOOL TABLES

Raymond A. Bergman, 107 E. Second St., Minster, Ohio 45865

Continuation-in-part of Ser. No. 684,725, May 10, 1976, Pat. No. 4,058,885. This application Sep. 22, 1977, Ser. No. 835,826

Int. Cl.² B23Q *7/00*

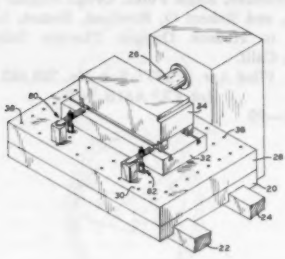
U.S. Cl. 269—20 **23 Claims**

1. In an apparatus for supporting a member having a table with a horizontal upper surface adapted to support a fixture thereon and means for supplying fluid under pressure between said table and the fixture supported thereon, a centering pin device comprising:

an outer pin mounted within said table and projecting above said table upper surface,

an inner pin being received within said outer pin for movement along a direction generally normal to said table surface, and

means for selectively causing said inner pin to project above said outer pin at a first vertical position and alternatively



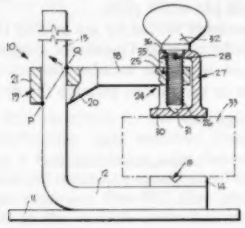
for causing said inner pin to retract to a second vertical position below said first vertical position.

4,143,869

ADJUSTMENT CLAMP

Roy A. Paterson, and Alan F. Paterson, both of Princes Hwy., Littlehampton, South Australia, Australia

Filed Apr. 10, 1978, Ser. No. 894,759
Claims priority, application Australia, Oct. 24, 1977, PD2160
Int. Cl.[2] B25B *5/10*
U.S. Cl. 269—166 **5 Claims**



1. An adjustment clamp having a foot, a post extending from and fixed with respect to the foot, a lower jaw on the foot,

an arm having a sleeve at one end and a threaded aperture at the other, the sleeve being movable along the post with the inner walls of the sleeve slidably engaging the walls of the post but locking on the post upon relative tilting of the sleeve and post,

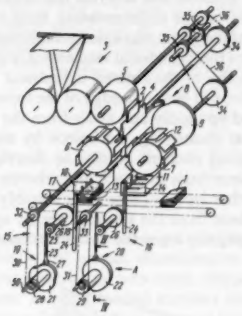
a clamping jaw carried on the free end of the arm, the clamping jaw being of box-like shape and have a lower wall, a front wall, an upper wall and a pair of spaced parallel side walls, said side walls engaging the free end of the arm and being guided thereby for relative movement in the direction of the fixed jaw, said upper wall containing an aperture and a clamping screw extending through the upper wall aperture and threadably engaging said threaded aperture in the arm, locating means locating the lower end of the clamping screw with respect to the lower wall of the clamping jaw, and the clamping screw bearing against said lower wall for effecting said relative movement.

4,143,870

FOLDER DELIVERY ARRANGEMENT FOR REEL-FED ROTARY PRINTING FOR PRESSES

Rafail Y. Voloshin, ulitsa Bulvar Verkhovnogo Soveta, 25a, kv. 70, Kiev; Leonid P. Grachev, ulitsa Serafimovicha, 2, kv. 181; Grigory A. Radutsky, 16 Parkovaya ulitsa 49, korpus 2, kv. 68, both of Moscow, and Rafail E. Kheifets, Chernobelskaya ulitsa, 3, kv. 63, Kiev, all of U.S.S.R.

Filed Jul. 27, 1976, Ser. No. 709,212
Claims priority, application U.S.S.R., Jul. 29, 1975, 2153401
Int. Cl.[2] B65H *45/02, 39/12*
U.S. Cl. 270—47 **3 Claims**



1. A folder delivery arrangement in reel-fed rotary printing presses, comprising: a driven arm for changing the direction of movement of newspaper prints discharged from the folder, said arm being located at the discharge end of said folder; finger-type lay-down devices for receiving newspaper prints delivered by said arm being located under the arm; drive shafts on which said finger-type lay-down devices are carried; a driving means for said shafts of said finger-type lay-down devices; comb-shaped stops of said finger-type lay-down devices; two box receptacles, one being located beneath each of said comb-shaped stops for receiving the newspaper prints delivered by the finger-type lay-down devices and for forming a pile of said newspaper prints; a box pallet for each box receptacle supported for vertical movement during pile formation; a mechanism for vertically moving said box pallet of each of said box receptacles; a roller table provided below said box receptacles for withdrawal of a formed pile; an improvement in said delivery arrangement being that said box pallet vertical moving mechanism is mechanically associated with the drive shaft of the finger-type lay-down devices by a cam-operated mechanism, the cam of said mechanism having a contour sufficient to provide downward movement of the box pallet at the speed required for the lay-down fingers to periodically press the folds of the newspaper prints in the pile when every next print is placed upon the top one in the pile.

4,143,871

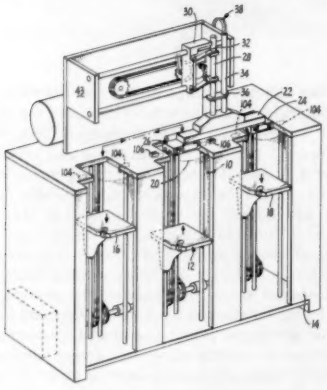
FACING PLY SEPARATOR

Hubert Blessing, Dallas, Tex., assignor to Levi Strauss & Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 701,857, Jul. 1, 1976, abandoned. This application Jun. 17, 1977, Ser. No. 807,348
Int. Cl.[2] B65H *3/22, 3/40*
U.S. Cl. 271—10 **16 Claims**

1. Apparatus for sequentially separating alternate layers of sheet-like workpieces from a single feed stack of sheet-like workpieces, the apparatus comprising means for differentiating each top workpiece layer from the feed stack and means for transporting the differentiated top workpieces alternately to a first location and to a second location, the differentiating means including at least one differentiating head, the differentiating head including a pair of cylindrical elements, means for

rotatably mounting the cylindrical elements parallel and opposite to each other, needles mounted in the curved surfaces of the cylindrical elements, projecting exteriorly of the curved surfaces, and in a direction away from the opposite cylindrical element, at least one, separate needle for stabilizing the workpiece position relative to the cylindrical elements, means for mounting the separate needle between the cylindrical elements to project beneath and normal to a hypothetical plane lying tangent to corresponding portions of the curved surfaces of the cylindrical elements, and means for selectively rotating one or more of the cylindrical elements to engage and disengage their needles with the top workpiece of the feed stack, depending on the direction of rotation and wherein the cylindrical elements are spaced apart on the differentiating head by slightly less than the width of the fabric workpieces such that upon rotation of one or more of the cylindrical elements in a direction which engages the needles of the rotated cylindrical element in the topmost workpiece, at least one edge of the topmost workpiece is thereby curled upwardly and away from the corresponding edge of the next underlying workpiece by the force of the engaged cylindrical element needles to thereby separate the topmost workpiece from the stack and wherein the differentiating means further includes means for forcibly separating the topmost workpiece from the separate needle upon disengagement of the workpiece from the cylindrical element needles.



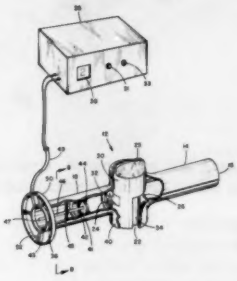
11. Apparatus for sequentially separating alternate layers of sheet-like workpieces from a single feed stack, the apparatus comprising means for separating each top workpiece layer from the feed stack and means for transporting the separated top workpieces alternately to a first location and to a second location, the separating means including at least one differentiating head having a pair of rotatable elements, means for mounting the rotatable elements so that their axes of rotation are parallel and opposite to each other, needles mounted in the rotatable elements so as to project exteriorly of the elements and in a direction away from the opposite rotatable element, means for selectively rotating at least one of the rotatable elements with respect to the other to engage and disengage the projecting needles of the rotated element with the top workpiece of the feed stack, depending on the direction of rotation, and for moving at least one rotatable element with respect to the other to decrease the spacing between the axes of rotation of the rotatable elements upon rotation of the rotatable element in a direction which engages its projecting needles in the topmost workpiece, whereby at least one edge of the topmost workpiece is curled upwardly and, upon movement of said rotated element toward the other element, the topmost workpiece is pulled away from the corresponding edge of the next underlying workpiece by the force of the engaged rotatable element needles to thereby separate the topmost workpiece from the stack.

4,143,872

LUNG VOLUME EXERCISER

Harold R. Havstad, Eagle Point, Oreg.; Miguel A. Ruksenas, Fallbrook, and Robert O. Rowland, Hemet, both of Calif., assignors to Hudson Oxygen Therapy Sales Company, Temecula, Calif.

Filed Apr. 7, 1977, Ser. No. 785,685
Int. Cl.[2] A61B *5/08*
U.S. Cl. 272—99 **7 Claims**



1. A device for exercising the lungs comprising:
a valve housing having a cavity, a gas inlet port, a gas outlet port, and a gas by-pass port, each communicating with said cavity;
a valve body moveably received in said cavity having a first passageway for communicating between said gas inlet and outlet ports, and a second passageway for communicating between said gas outlet port and said gas by-pass port;
whereby movement of said valve body provides selective alignment of said first and second passageways with said ports for determining the respective volumes of gas passing through said inlet port and said by-pass port;
a gas inlet pipe communicating with said valve housing through said gas inlet port;
a gas outlet pipe communicating with said valve housing through said gas outlet port;
a moveable member moved by gas passing through said gas inlet and outlet pipes; and means for monitoring the movement of said moveable member for counting sequential inspirations or expirations through the device.

4,143,873

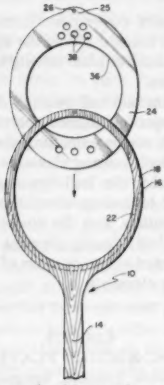
PRACTICE TENNIS RACKET WITH RACKET HEAD INSERT

Robert M. Andreoli, 255 Rumstick Point Rd., Barrington, R.I. 02806

Filed Mar. 13, 1978, Ser. No. 886,623
Int. Cl.[2] A63B *69/38*
U.S. Cl. 273—29 A **10 Claims**

1. A practice racket for tennis and the like in which proper execution of a preferred practice stroke against a game ball by a player is performed comprising, a handle portion adapted to be grasped by the player to execute a stroke, and a peripheral frame, said frame being free of strings and being attached to said handle and defining an area corresponding to the strung impact area of a conventional tennis racket wherein a ball is normally struck in regular game play, an insert having a substantially planar area and being engaged by and positioned within said frame and being substantially parallel to the plane of said frame, said insert defining a ball impact area and a ball passage area for said practice racket, said ball passage area

being defined by an opening positioned generally centrally of said insert whereby a game ball may pass entirely therethrough



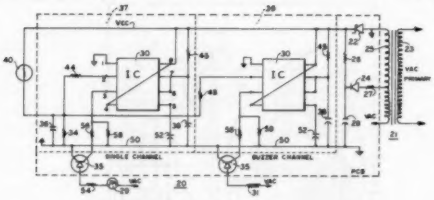
upon proper execution of said practice stroke, said opening being completely unobstructed.

4,143,874

FOUL LINE DETECTOR CIRCUIT

Richard S. McGehee, 1509 Crawford La., Hanover Park, Ill. 60103

Filed Aug. 24, 1977, Ser. No. 827,172
Int. Cl.[2] A63D 5/04
U.S. Cl. 273—50 **4 Claims**



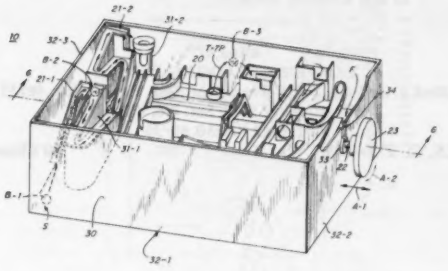
4. A foul line detector circuit for use with light source means including in combination light sensitive variable resistance means providing a first resistance state thereof during light exposure and a second resistance state thereof during interruption of said light exposure, first RC time constant network means connected to the variable resistance means and being responsive to the first resistance state to charge and to the second resistance state to discharge, the time period elapsed during the discharge thereof to a predetermined value of charge comprising a first time delay, integrated circuit timer means having means for sensing the discharge of the first RC time constant means, means for triggering activation of the integrated circuit timer means after the first time delay occurs, means for providing an output signal during activation thereof, second RC time constant network means connected to receive the output signal of the integrated circuit timer means and to accumulate a charge in response thereto, the time period elapsed during the charge thereof to another predetermined value of charge comprising a second time delay, said integrated circuit timer means further having means for sensing the charge of the second RC time constant means and means for triggering deactivation of the integrated circuit means after the second time delay occurs, switching means activated by the output signal of the integrated circuit timer means, and indicator means activated with activation of the switching means to indicate interruption of the light source means for a time period at least equal to the first time delay period.

4,143,875

GAME WITH PIVOTING MEMBER AND COORDINATED CIRCUITOUS PATHS

Walter P. Browning, 377 Avon Rd., Devon, Pa. 19333, and William L. Dodge, 526 Panmure Rd., Haverford, Pa. 19041

Filed Jan. 10, 1977, Ser. No. 758,320
Int. Cl.[2] A63F 7/04
U.S. Cl. 273—101 **18 Claims**



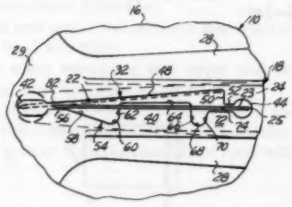
1. A game assemblage comprising a playing object; a first member including a first partial, discontinuous circuitous path containing a first plurality of non-linear obstacle elements at various nonplanar levels; a second member pivotable relative to said first member and including a second partial, discontinuous, circuitous path containing a second plurality of non-linear obstacle elements at various nonplanar levels; said second partial, discontinuous, circuitous path being coordinated with individual non-linear obstacle elements of said first partial circuitous path at a plurality of points so as to form a complete continuous, circuitous path and means for manipulating said second member relative to said first member to move a playing object from one of the members to the other member and back to the one member so that the playing object travels the complete, continuous, circuitous path by traveling over said obstacle elements.

4,143,876

ARROWHEAD WITH REPLACEABLE AUXILIARY BLADE

Edward J. Henkel, Rte. 1, Bartlett Rd., Williamsburg, Mich. 49690

Filed Mar. 24, 1977, Ser. No. 780,779
Int. Cl.[2] F41B 5/02
U.S. Cl. 273—106.5 B **7 Claims**



1. An arrowhead, comprising
an elongated ferrule having a rearward socket adapted to receive the forward end of an arrow shaft and having a forward portion with a main blade mounted thereon and having an intermediate portion with a pair of transversely-aligned slots therein disposed transverse to said main blade and extending longitudinally through said ferrule.
said main blade having an opening therethrough disposed substantially in alignment with said slots,
and an approximately triangular auxiliary blade which is

shorter and thinner than said slots having a longitudinally-elongated forwardly-tapering central aperture therein and an unbroken peripheral portion extending continuously around said central aperture,

at least one of said slots having a detent projection extending inward from one edge thereof into said central aperture into gripping engagement with said forwardly-tapering edge portion thereof in response to the rearward sliding of said auxiliary blade during the insertion of said auxiliary blade.

4,143,877

GOLFER'S TRAINING DEVICE

Alfred J. Jeffries, 24525 Rensselaer, Oak Park, Mich. 48237

Filed Jun. 6, 1977, Ser. No. 803,527

Int. Cl.[2] A63B *69/36*

U.S. Cl. 273—183 E **10 Claims**

1. A training aid for golfers adapted to be positioned adjacent a golf ball comprising:

a base;

target means supported on said base and including a generally arcuate upwardly facing target surface having a plurality of intersecting lines provided thereon;

a sighting object; and

an elongated support means having at least one end portion secured to a portion of said target means and supporting said sighting object in a spaced relationship with said generally arcuate surface, said sighting object being positioned with respect to said target surface so as to be visually alignable along the line of sight of a golfer addressing said adjacent golf ball, said training device being operative to indicate head movement of said golfer during execution of a golf swing.

4,143,878

THREE DIMENSIONAL BALL GAME DEVICE

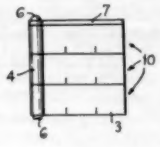
Ervin L. Unique, P.O. Box 99, Terang, Australia (3264)

Filed Aug. 22, 1977, Ser. No. 826,763

Claims priority, application Australia, Aug. 26, 1976, 7167/76

Int. Cl.[2] A63F *3/00*

U.S. Cl. 273—241 **3 Claims**



1. A three dimensional ball game device comprising:

a plurality of open-topped, substantially square, box-shaped ball housing elements formed from transparent plastics material and stacked one upon another to form a rectangular block structure,

each of said ball housing elements including partitions which divide the ball housing element into compartments of equal length and width and of about one third the height of the ball housing element,

each ball housing element having hinge means adjacent one of its corners,

a substantially square cover plate formed from transparent plastics material located above the upper most ball housing element, said cover plate having hinge means adjacent one of its corners,

said hinge means on said ball housing elements and said top cover plate comprising aligned apertures extending therethrough and pin means extending through said apertures to connect the ball housing elements and top cover plate together, whereby the ball housing elements and top cover plate can be swung about the pin means with respect to one another, and the cover plate can be swung over the upper ball housing element,

coloured balls located in one or more of the compartments in the ball housing elements.

4,143,879

DISC-RECORD PLAYERS

John P. Wren, Swindon, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland

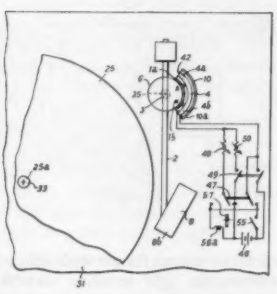
Continuation-in-part of Ser. No. 736,222, Oct. 27, 1976, Pat. No. 4,076,258. This application Oct. 7, 1977, Ser. No. 840,366

Claims priority, application United Kingdom, Oct. 11, 1976, 42212/76

The portion of the term of this patent subsequent to Feb. 28, 1995, has been disclaimed.

Int. Cl.[2] G11B *3/10*

U.S. Cl. 274—23 R **15 Claims**



2. A device for applying, to a phonograph pickup arm mounted on an arm support arranged for joint pivotal movement about a vertical axis relative to a base member, torque about said axis said phonograph pickup arm also being mounted for vertical movement between a playing position and a raised position, said device comprising a permanent magnet means mounted for joint movement with the arm support about said axis and constructed and magnetized to provide two pole faces of opposite polarities, angularly spaced about said axis, both arranged substantially in a common surface of revolution about said vertical axis with each said pole face extending over an angle about said axis at least equal to the angle of operative movement of the pickup arm about said axis with the two pole faces angularly spaced about said axis, said magnetic means being magnetized to produce magnetic flux at right angles to each pole face; a winding of conductor wire, mounted to be stationary relative to said base member and having two portions arranged in close proximity to said pole faces, said two portions being arranged for respective electrodynamic co-operation with the flux from each of said pole faces, yoke means of magnetizable material which are mounted for joint movement with said magnet means and arranged to provide a yoke surface facing each said pole surface at such a distance therefrom as to provide a gap sufficient to accommo-

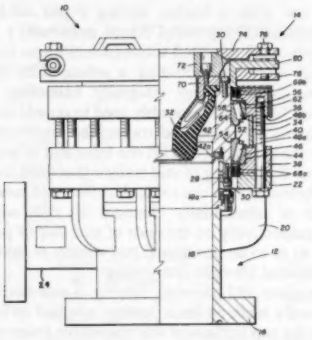
date said winding portions and form a low-reluctance magnetic circuit for the magnetix flux that extends between each pole face and the yoke surface facing such pole face, the lengths of conductor wire in each said portion extending substantially parallel to said surface of revolution and transversely to the velocity vector of that element of said surface which directly faces the respective portion, said winding portions being electrically connected in series in such manner that when the winding is energized, the electric current flow in each of said winding portions produces, with the magnet flux passing said portion from the magnet means, torque about said axis in the same direction; electric circuit means incorporating said winding, switch means forming part of said circuit means and operable, when said circuit means are connected to a suitable source of direct current, to selectively pass, when the pickup arm is in such raised position, motor current from such source through said winding selectively in one or other of two opposite directions and at such strength as to produce, by its electrodynamic co-operation with the flux from the said pole faces, a torque about the said vertical axis in one or other direction according to the selected direction of the current, the device also including damping means for controlling the speed of such movement.

4,143,880

REVERSE PRESSURE ACTIVATED ROTARY DRILL HEAD SEAL

Alison R. Bunting, and Martin J. Sharki, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 23, 1978, Ser. No. 889,323
Int. Cl.[2] F16J *15/56, 15/32*
U.S. Cl. 277—31 **6 Claims**



1. A rotary drill head apparatus that provides a seal between a rotary drill string and the well bore to contain the pressure of fluid within the well bore, comprising:

a wash pipe extending from the well bore;

a rotating head assembly positioned to rotate about said wash pipe, said rotating head assembly being sealingly engaged to rotate with said rotary drill string;

first lip seal means for providing a dynamic seal between the rotary drill string and the well bore, said first lip seal means having a pair of lip elements;

second lip seal means for providing a dynamic seal between the rotary drill string and the well bore, said second lip seal means having a pair of lip elements;

a space between said first lip seal means and said second lip seal means with said space being between said pair of lip elements of said first lip seal means and said pair of lip elements of said second lip seal means; and

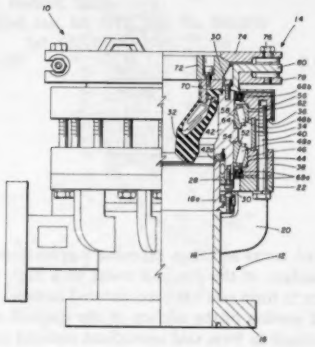
means for maintaining lubricant in said space at a greater pressure than the pressure of fluid within the well bore.

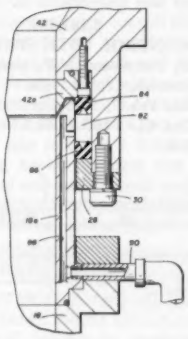
4,143,881

LUBRICANT COOLED ROTARY DRILL HEAD SEAL

Alison R. Bunting, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 23, 1978, Ser. No. 889,324
Int. Cl.[2] F16D *3/06;* F16J *15/16*
U.S. Cl. 277—31 **4 Claims**





1. In a rotary drill head that provides a dynamic seal between a rotary drill string and the well bore thereby containing the pressure of fluid within the well bore, said rotary drill head including a wash pipe, a rotating head assembly positioned to rotate about said wash pipe and means for sealingly engaging said rotating head assembly to said rotary drill string, the improvement comprising:

an upper seal unit positioned between said wash pipe and said rotating head assembly;

a lower seal unit positioned between said wash pipe and said rotating head assembly;

an annular space separating said upper seal unit and said lower seal unit; and

means for circulating lubricant through said annular space and for maintaining lubricant in said annular space at a pressure greater than the pressure of fluid within the well bore.

4,143,882

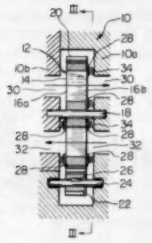
RUBBING CONTACT FLUID SEAL

Osamu Kobayashi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Sep. 3, 1976, Ser. No. 720,520
Claims priority, application Japan, Sep. 5, 1975, 50-107745
Int. Cl.[2] F16J *15/34*
U.S. Cl. 277—96.2 **5 Claims**

1. A rubbing contact fluid sealing member comprising an oxidized sintered metallic layer in rubbing contact with a

rotating member and an unoxidized sintered metallic layer formed integral with said oxidized sintered metallic layer, said sealing member produced by first sintering a mixture of metallic nickel, nickel oxide and calcium fluoride powders to form a



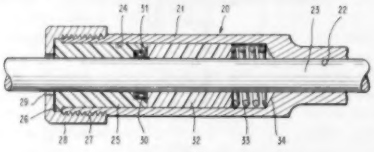
sintered metal and then exposing a predetermined portion of the surface of the sintered metal to a high temperature air stream to form said oxidized sintered metallic layer, the unexposed portion of the surface of the sintered metal remaining unoxidized to form said unoxidized sintered metallic layer.

4,143,883

PUSH-PULL CONTROL WITH SPRING-LOADED SEAL

Alan H. Paynter, Thornwood, N.Y., assignor to Controlex Corporation of America, Croton Falls, N.Y.

Filed Feb. 7, 1978, Ser. No. 875,873
Int. Cl.[2] F16C *1/28;* F16J *15/32*
U.S. Cl. 277—164 **8 Claims**



1. In an end fitting of a push-pull remote control wherein the cylindrical end rod of the push-pull element extends therethrough, the improvement of a spring-loaded plastic ring seal disposed within said end fitting, said ring seal comprising a flexible plastic ring having a C-shaped cross-section and a metal coil spring inserted in said C-shaped cross-section and extending circularly throughout said plastic ring to press the two opposite free lips of said C-shaped cross-section apart, said ring seal being disposed with one of said lips in pressing contact with said end rod.

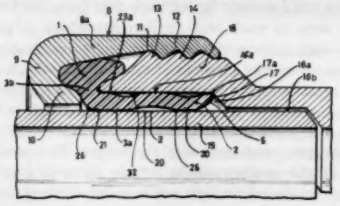
4,143,884

SEALING MEMBER FOR SPIGOT-AND-SOCKET PIPE COUPLING

Terry G. Nicholas, Twford, United Kingdom, and Albertus A. Oostenbrink, Hardenberg, Netherlands, assignors to Wavin B.V., Zwolle, Netherlands

Filed Aug. 16, 1977, Ser. No. 825,063
Claims priority, application Netherlands, Aug. 18, 1976, 76 09192
Int. Cl.[2] F16L *21/04;* F16J *15/10, 15/32*
U.S. Cl. 277—207 A **47 Claims**

1. An annular sealing member for cylindrical piping spigot and socket couplings in which the sealing member comprises an outer annular retaining member, a sealing part and a connecting part interconnecting the retaining and sealing part, said sealing part extending stepwise continuously radially inwardly of said annular retaining member and extending axially along said member and not exceeding in thickness the portion



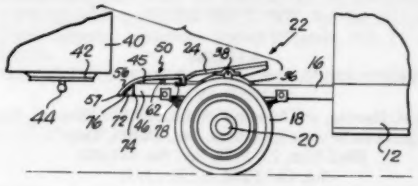
extending between its free end and its point of attachment to said outer annular retaining member.

4,143,885

TRACTOR TRAILER LIFT RAILS

Barry A. Mahosky, 55 Charleston St., Wellsboro, Pa. 16901

Filed Jul. 29, 1977, Ser. No. 820,150
Int. Cl.[2] B62D *21/00;* B60D *1/00*
U.S. Cl. 280—477 **5 Claims**



1. For use with a tractor having a pair of longitudinal, spaced, substantially parallel frame members, a fifth wheel assembly pivotally mounted between said frame members, said fifth wheel assembly including a substantially planar plate having an inclined ramp integrally extending rearwardly thereof, said fifth wheel assembly used to couple said tractor to the king pin of an associated trailer, the improvement which comprises means adapted to lift the front end of said associated trailer upon the backing of said tractor thereinto for facilitating coupling between said tractor and trailer, said means comprising a pair of substantially identical lift rails adpated to be mounted respectively on the ends of said pair of parallel frame members so as to be positioned rearwardly of said ramp, each of said identical lift rails comprising:

an elongated rail member having a substantially planar, upwardly inclined main portion adapted to be positioned over the top surface of the respective frame member;

a downwardly depending flange formed at the forward end of said main portion adapted to be fastened to the top surface of said frame member; and

a downwardly depending curved rear end portion extending integrally and rearwardly from said main portion to a position below the top surface of said frame member.

4,143,886

SAFETY SKI BINDING

Georges P. J. Salomon, Annecy (Haute-Savoie), France, assignor to Etablissements Francois Salomon et Fils, Annecy (Haute-Savoie), France

Filed Sep. 23, 1976, Ser. No. 725,871
Claims priority, application France, Sep. 30, 1975, 75 29924
Int. Cl.[2] A63C *9/08*
U.S. Cl. 280—624 **8 Claims**

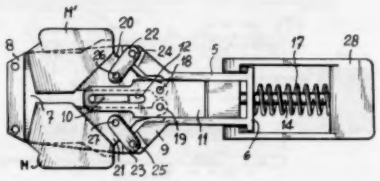
1. A safety binding for a ski boot, comprising

(a) a baseplate mounted upon the ski;

(b) two lateral jaws movable relative to said baseplate and arranged symmetrically relative to the longitudinal axis of

said ski, said jaws cooperating with the lateral sides of said boot;

(c) a slide means subjected to the action of a resilient element and adapted to slide upon said baseplate in the direction of the longitudinal axis of said ski, said slide means and its associated resilient element biasing said jaws toward position in which said jaws are kept bearing against said boot; and



(d) two pairs of links arranged symmetrically in relation to the longitudinal axis of said ski, each pair comprising a link hinged to a fixed point of the baseplate, and a link hinged to said slide means, said links being furthermore hinged to one another, and one of said links being integral with one of said jaws, each of said fixed points being located at a position longitudinally of the ski between the hinge point on the corresponding jaw and the corresponding hinge point on said slide means.

4,143,887

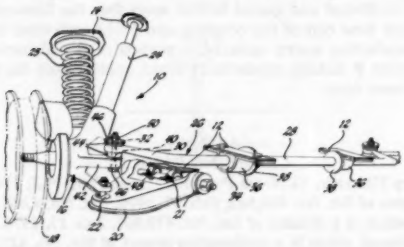
INDEPENDENT REAR SUSPENSION SYSTEM

Alverson B. Williams, Sterling Heights, and Alfred D. Bodnar, Pontiac, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 21, 1977, Ser. No. 863,053

Int. Cl.[2] B60G *3/06, 11/64*

U.S. Cl. 280—697 **6 Claims**



1. An independent rear suspension system for a motor vehicle including a vehicle frame supporting a body and oppositely disposed wheel carriers rotatably supporting rear wheels, said suspension system comprising a pair of laterally extending control arms having the inner ends thereof pivotally connected to said frame and the outer ends thereof pivotally connected to respective wheel carriers, a pair of telescoping strut dampers having the lower ends thereof rigidly connected to respective wheel carriers and the upper ends thereof connected to said body, a torsion bar having a transversely oriented center portion and longitudinally oriented end portions, means connecting the transverse center portion of said torsion bar to said frame, and means connecting the distal ends of said torsion bar to said wheel carriers a predetermined distance away from the pivotal connection between the wheel carriers and the respective control arms as seen in the plan view, such that said distal ends of said torsion bar can move in the vertical direction only, said torsion bar serving as a stabilizer bar and as links cooperable with said wheel carriers to provide roll steer characteristics to said rear wheels.

4,143,888

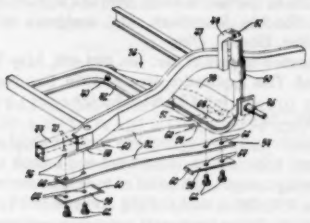
INDEPENDENT REAR SUSPENSION SYSTEM

Howard G. Heinig, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 12, 1978, Ser. No. 868,891

Int. Cl.[2] B60G *3/04, 11/46*

U.S. Cl. 280—697 **3 Claims**



1. For use with a vehicular frame having a side rail and rear cross member means, an independent rear suspension system comprising a transversely-oriented control arm pivotally connected at the inner end thereof to said rear cross member means and extending outwardly past said side rail, a wheel spindle formed on the outer end of said transversely-oriented control arm, a telescoping shock absorber operatively mounted between the upper surface of said control arm and a side surface of said side rail, and a longitudinally-oriented cantilever leaf spring having the rear end portion thereof secured to said control arm and the front end portion thereof secured to said side rail and serving as a load carrying member and spring means for the suspension system.

4,143,889

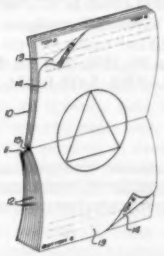
LARGE PRINT BOOKS AND METHOD FOR PRODUCING THE SAME FROM REGULAR SIZE BOOKS

John A. Scharlin, 510 E. Andover Dr., Burbank, Calif. 91504

Continuation-in-part of Ser. No. 613,620, Sep. 15, 1975, Pat. No. 4,073,510. This application Dec. 12, 1977, Ser. No. 859,274

Int. Cl.[2] B42C *1/00*

U.S. Cl. 281—15 R **14 Claims**



1. A method of producing large print size books from a original book of smaller print size, comprising: utilizing a copy of each page of said original book to provide individual first sheets; severing each first sheet approximately in half to produce copies of the top half and the bottom half of each page; printing an enlarged copy of the bottom half of each first sheet and the top half of each first sheet on opposite sides of individual second sheets with the enlarged bottom of a page and the enlarged top of the succeeding page in a predetermined relation to an edge of said second sheets; and binding said second

sheets together at said edge with the top half of each page of said original book enlarged from said first sheet at one side of the binding and the bottom half of each page of said original book enlarged from said first sheet at the other side of the binding.

4,143,890

PRESSURE-SENSITIVE CARBONLESS TRANSFER SHEETS USING HOT MELT SYSTEMS

Gerald T. Davis; Gerhart Schwab, both of Chillicothe, Ohio, and Dale R. Shackle, Scottsboro, Ala., assignors to The Mead Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 684,459, May 7, 1976, abandoned. This application Dec. 6, 1976, Ser. No. 747,682

Int. Cl.[2] B41M *5/22*

U.S. Cl. 282—27.5 **5 Claims**

1. A pressure-sensitive carbonless transfer sheet comprising:

(a) a paper substrate having a front and a back surface; and

(b) a coating composition adhered to at least one of said front and back surfaces, said coating composition being set to a flexible, tack-free coat, said coating composition including:

(1) a solvent-free, non-aqueous hot melt suspending medium characterized by:

(i) being substantially water insoluble;

(ii) being characterized by the presence of one or more functional groups selected from the group consisting of: carboxyl, carbonyl, hydroxyl, ester, amide, amine, heterocyclic groups and combinations thereof to impart polarity thereto;

(iii) having a melting point of from about 60° C. to about 140° C. and a melting point range of less than about 15° C.; and

(2) an encapsulated chromogenic material substantially dispersed therein, said chromogenic material being a color precursor of the electron donating type, said hot melt suspending medium being compatible with color forming characteristics of said capsular, chromogenic material.

4,143,891

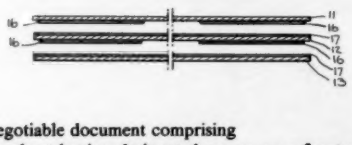
NEGOTIABLE DOCUMENT

Frank Neubauer, Mt. Kisco, N.Y., assignor to Transkirt Corporation, Elmsford, N.Y.

Filed Dec. 29, 1976, Ser. No. 755,207

Int. Cl.[2] B41L *5/00*; B41M *5/10*

U.S. Cl. 282—27.5 **2 Claims**



1. A negotiable document comprising

a cover sheet having designated spaces on a front surface thereof to receive information and a layer of hot spot carbon on a back surface thereof in alignment with each of said designated spaces; and

at least one duplicating sheet disposed under said cover sheet, said duplicating sheet having designated spaces on a front surface thereof to receive a copy of the information placed on said spaces of said cover sheet and a coating of microcapsules of oleic acid for impregnating said duplicating sheet with the received copy.

4,143,892

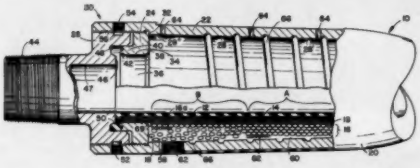
HOSE COUPLING

Michael J. Murphy, Denver, Colo.; Dale E. McVey, La Harpe, Kans.; David A. Slipcheck, and Gene E. Stefano, both of Littleton, Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Nov. 14, 1977, Ser. No. 851,335

Int. Cl.[2] F16L *39/02*

U.S. Cl. 285—149 **16 Claims**



1. In combination, a reinforced hose and coupling assembly having respective hose and fitting ends comprising:

a coupling body sleeve having an inner bore of differing dimension progressing from a lesser dimension at the hose end of the assembly to an enlarged zone near the fitting end thereof;

a ring portion coupled to the sleeve within the inner bore and having, adjacent the enlarged zone, an inwardly directed shoulder, and having a counterbore coaxial with the sleeve and of lesser dimension than the enlarged zone of the sleeve inner bore;

hose inner layer comprising tube and/or carcass axially disposed within the sleeve and positioned adjacent the counterbore of the ring;

multiple plies of reinforcement filaments disposed between the hose inner layer and inner bore of the sleeve, the filaments of the plies in the hose end of the coupling being relatively closely and uniformly spaced, and at least a substantial portion of the filaments of the plies which extend beyond the hose end together with the filaments in the enlarged zone (zone "B", FIG. 1) being randomly distributed and spaced farther apart than the filaments in the hose end of the coupling and being embedded in an anchoring matrix material, a portion of the filaments in zone B making substantially direct contact with the hose inner layer.

4,143,893

CLAMPING DEVICE

Henry Fleischer, 18 Notch Park Rd., Little Falls, N.J. 07424

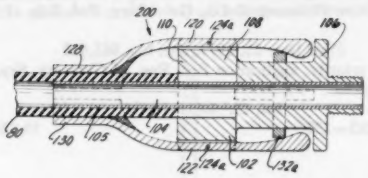
Division of Ser. No. 658,582, Feb. 17, 1976, Pat. No. 4,062,573, which is a division of Ser. No. 479,667, Jun. 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 427,149, Dec. 21, 1973, abandoned. This application Jul. 28, 1977, Ser. No. 819,822

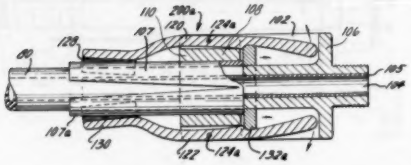
Int. Cl.[2] F16L *33/22*

U.S. Cl. 285—243 **10 Claims**

1. A clamping member for manually attaching one part of a two part hose coupling device to a hose without the need for employing tools, comprising, in combination, a body section having a bore running therethrough, and comprising a first end portion, an intermediate portion and a second end portion, said first end portion being adapted to be connected to one part of a two part hose coupling device; at least a pair of spaced apart clamping rods each pivotally connected to said body section of said clamping member, each of said clamping rods including a clamp section connected at one end of said rod; and rod moving means disposed about said body section of said clamping member between said body section and said clamping rods, further including an outer sleeve member disposed in said body section of said clamping member in a manner such that when a hose section is fitted within said clamping member, a portion of said hose is disposed under or within said outer sleeve, said

outer sleeve being adapted to be crushed against said hose by said clamping rods so that when a hose is inserted in said second end portion of said body section said rod moving means can be manually moved away from said clamp sections of said





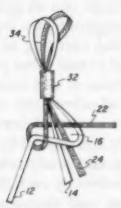
clamping rods so as to force said clamp sections downwardly towards said body section and against said outer sleeve and said hose and thereby hold said hose in place in said body section and in communication with said one part of said coupling device.

4,143,894

METHOD OF MAKING DECORATIVE RING LINKS AND ARTICLE PRODUCED THEREBY

Louis H. Press, 1225 E. 68th St., Brooklyn, N.Y. 11234

Filed Jan. 16, 1978, Ser. No. 870,029
Int. Cl.[2] D04G 5/00; B65H 69/04
U.S. Cl. 289—1.2 **10 Claims**



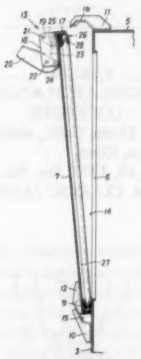
1. A method of making a decorative ring link comprising:
(a) placing a first piece of lacing and a second piece of lacing in substantially parallel alignment;
(b) bending said pieces of lacing so that each piece has a longer strand and a shorter strand;
(c) binding said pieces of lacing at a location so as to cause the bent portion of each of said pieces of lacing to form an open eyelet portion above said location and so as to leave a longer strand and a shorter strand of each piece below said location, the longer strand of the first piece being a looper and the longer strand of the second piece being a weaver;
(d) forming a loop to one side of the shorter strands of said pieces with said looper by arcing it away from and then transversely in front of said shorter strands;
(e) passing said weaver over said looper, then passing it behind said shorter strands and then weaving it through the loop formed by said looper;
(f) pulling said looper and said weaver so as to tighten a resulting knot about said shorter strands;
(g) repeating the procedure of steps (d) through (f) but forming the loop on the side of the shorter strands opposite from the side where the previous loop was formed;
(h) repeating the procedure steps (d) through (g) so as to form a plurality of resulting knots about said shorter strands;
(i) cutting through each piece of lacing at its eyelet portion so that each shorter strand becomes separate from its corresponding longer strand;
(j) forming an endless ring by inserting one end of at least one shorter strand under one or more knots located at the distant end therefrom; and,
(k) continuing to form additional knots about said shorter strands, at least until the last formed knot is formed substantially contiguously to the first formed knot.

4,143,895

INSTANT FASTENER FOR THE RELEASABLE FIXING OF A REMOVABLE HOUSING PART

Karl Kirchweger; Helmut Foidl, both of Graz, Austria; Hans List, 126, Heinrichstrasse, Graz, Austria, and Josef Greier, Graz, Austria, assignors to Hans List, Graz, Austria

Filed Aug. 18, 1977, Ser. No. 825,779
Claims priority, application Austria, Aug. 27, 1976, 6374/76
Int. Cl.[2] E05C 3/08
U.S. Cl. 292—223 **7 Claims**



1. An enclosure for an internal combustion engine which has a removable maintenance cover, said enclosure including a side having an opening allowing access to said enclosed engine, a removable maintenance cover capable of covering said opening, first and second support means mounted on said enclosure adjacent opposed sides of said opening for fastening said maintenance cover thereto to cover said opening, and first and second holder means on opposite sides of said maintenance cover which respectively cooperate with said first and second support means on said enclosure to fasten said maintenance cover to cover said opening; each said first and second support means mounted on said enclosure comprising a base portion and an extension portion which extends away from said base portion in a direction towards the other of said opposed supports, each said extension portion having a supporting surface facing the side of said enclosure having said opening; said first holder means mounted on said maintenance cover comprising a guide means capable of snugly fitting within the area formed between the supporting surface of the exterior portion of said first support means mounted on said enclosure and the side of said enclosure having said opening; said second holder means mounted on said maintenance cover comprising a movable fastening element capable of fitting within the area formed between the supporting surface of the extension portion of said second support means mounted on said enclosure and the side of said enclosure having said opening.

4,143,896

LOCK ACTUATOR

Domenic Giancaterino, 13 Wahnita Rd., Worcester, Mass. 01606

Continuation of Ser. No. 736,960, Oct. 29, 1976, abandoned.
This application Nov. 18, 1977, Ser. No. 852,668
Int. Cl.[2] E05C *13/04*
U.S. Cl. 292—347 3 Claims

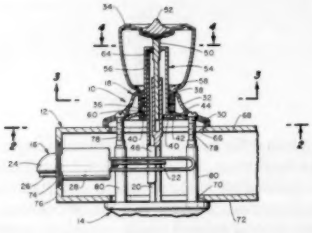
1. Lock actuator for automobile door, comprising a main body having a smooth cylindrical surface adapted to fit in a door sill opening, a threaded bore extending inwardly from one end for attachment to a threaded lock rod, a short frustoconical extension being integrally formed at the other end, and a small transverse bore being provided at the other end, and a small transverse bore being provided at said other end.

4,143,897

FIRE SHIELDED DOORLATCH KNOB ASSEMBLY FOR LOCKSETS

Gary R. Bergen, Yorba Linda, Calif., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Oct. 14, 1977, Ser. No. 842,059
Int. Cl.[2] E05C *13/00*
U.S. Cl. 292—347 14 Claims



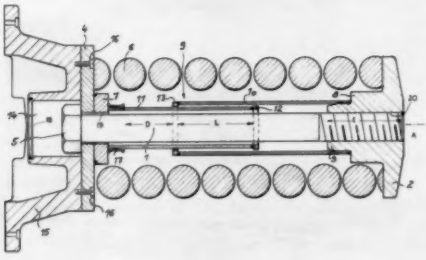
1. In a fire shielded doorlatch knob assembly of the type having a hollow knob inwardly secured to a hollow generally cylindrical thickened insert and the insert extending through a mounting rose securable at a door side, the knob insert having retainment means thereon inwardly of the rose axially inwardly retaining the knob and insert rotatable relative to the rose, a spindle adapted for axially inward driving connection to a doorlatch mechanism and having an outer end telescoped by the knob insert and drivingly connected to the knob and insert, whereby a relatively large axial opening is formed along the spindle through the hollow insert and into the interior of the hollow knob normally permitting the reverse passage of flames through the assembly upon heat destruction of the knob; the improvements comprising: a hollow shield of fire resistant material mounted interiorly of the knob having wall means and outer end means thereon for respectively outwardly radially and outwardly axially closing off said insert opening into the knob interior, thereby preventing said reverse passage of flames through the assembly upon heat destruction of the knob.

4,143,898

BUMPER FOR TRACK SUSPENSION OF A TRACKLAYING VEHICLE

Helmuth Klaus, Hagen-Haspe; Carl Fass, Ennepetal, and Heinz Lause, Recklinghausen, all of Fed. Rep. of Germany, assignors to Intertrac Viehmann & Co., Gevelsberg, Fed. Rep. of Germany

Filed Dec. 23, 1977, Ser. No. 863,625
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1977, 2741105
Int. Cl.[2] B61F *19/04*
U.S. Cl. 293—137 10 Claims



1. A bumper for a track suspension of a tracklaying vehicle, said bumper comprising:

a first plate having a throughgoing hole;

an elongated rod extending through said hole and having one longitudinal end to one longitudinal side of said first plate and another longitudinal end having a wide part to the other longitudinal side of said hole;

a second plate secured to said one longitudinal end of said rod and spaced by a predetermined distance from said first plate, said second plate being longitudinally displaceable with said rod toward said first plate;

a helical compression spring having in unstressed condition an overall length greater by a predetermined difference than said predetermined distance and braced in compressed condition between said plates;

an inner sleeve fixed to one of said plates, surrounding said rod, extending longitudinally from said one plate toward the other plate, and carrying an inner abutment; and

an outer sleeve fixed to said other plate, surrounding said rod and at least a portion of said inner sleeve, extending longitudinally from said other plate toward said one plate, and carrying an outer abutment between said inner abutment and said one plate and spaced by a predetermined spacing at least as large as said predetermined difference from said inner abutment, whereby on failure of said rod and extension of said spring said abutments will only engage each other when said spring is substantially fully expanded.

4,143,899

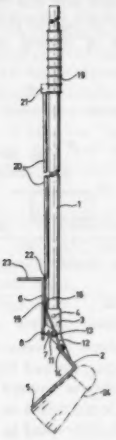
GATHERING IMPLEMENT

Henry E. Wetherall, and Edith K. Mount Hill, both of Weybridge, England, assignors to Q. V. Sales Limited, Sevenoaks, England

Filed Nov. 15, 1977, Ser. No. 851,798
Int. Cl.[2] A01K *29/00*
U.S. Cl. 294—50.9 7 Claims

1. An implement for gathering objects lying on the ground comprising an elongated handle having an upper end and a lower end, a collar slidably mounted about the handle adjacent the upper end thereof, a first L-shaped member mounted on the lower end of the handle, one leg of which first L-shaped member is angled downwardly and forwardly of the handle, a second L-shaped member mounted adjacent the lower end of the handle for movement between an inactive position with one leg thereof aligned axially of the handle and the other leg extends normally to the axis of the handle and an active posi-

tion in which the two L-shaped members form an enclosure defined by the four legs of the two L-shaped members and cooperate to gather objects lying on the ground, an elongated link member pivotally connected at its upper end to the aforementioned collar and pivotally connected at its lower end to the rear of the second L-shaped member adjacent the angle



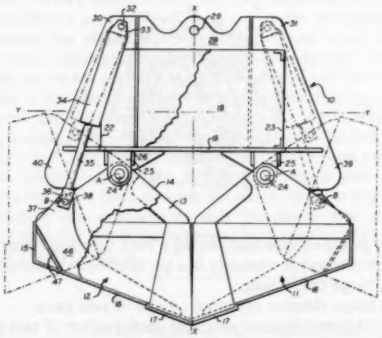
between the legs thereof, movement of the collar downwardly towards the lower end of the handle angling the lower end of the link outwardly of the handle and rotating the second L-shaped member downwardly and outwardly of the handle and over thereby to define the objects-retaining enclosure for objects scooped from the ground by the lower leg of the first L-shaped member.

4,143,900

MATERIAL HANDLING BUCKET ARRANGEMENT

Joseph F. Longo, Wilton, Conn., assignor to Condor International Corporation, South Norwalk, Conn.

Filed Mar. 7, 1977, Ser. No. 775,208
Int. Cl.[2] B66C *3/02*
U.S. Cl. 294—70 **9 Claims**



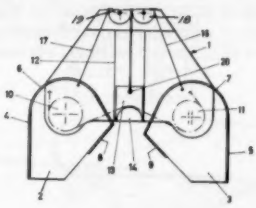
1. A material handling bucket comprising a pair of bucket bowls, and a power head-frame supporting said bucket bowls, comprising a substantially horizontal deck, vertical side bulkheads, vertical end bulkheads extending upwardly from said deck, and a cross beam integrally fixed to the upper edges of said end bulkheads and extending parallel to the side bulkheads, said bulkheads and said deck being connected together to form an integral water-tight box-like enclosure, each of said bowls being pivotally mounted to the lower surface of the deck of said frame to swing about a first axis adjacent the respective end bulkheads between an open position for reception of material therein and a closed position for transporting the material, a hydraulic ram positioned exterior of each of said end bulkheads in association with each of said bowls, a pair of plates straddling each of said hydraulic rams, said plates extending outward perpendicularly to the associated end bulkheads and from said cross beam to at least said deck, said plates being integrally secured to said cross beam, said end bulk heads and said deck and forming an open tunnel in which the associated hydraulic ram sits, said hydraulic rams being pivotally connected to said cross beam at one end and to the associated bowl at the other end at a second axis remote from the first axis and means for actuating each of said hydraulic rams to reciprocate each of said hydraulic rams for moving said bowls between said open and closed positions.

4,143,901

MECHANICAL GRAB

Leendert van Huuksloot, Zevenbergseboek, Netherlands, assignor to Nemag, B.V., Rotterdam, Netherlands

Filed Nov. 9, 1976, Ser. No. 740,216
Claims priority, application Netherlands, Nov. 13, 1975, 7513279
Int. Cl.[2] B66C *3/01*
U.S. Cl. 294—70 **6 Claims**



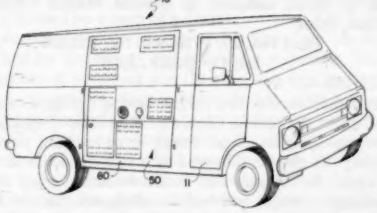
1. A mechanical grab consisting essentially of a frame, pivoting means mounted on said frame, two round-bottomed scoops with straight-walled sides pivotable on said pivoting means in such a manner that, when pivoting from an open position to a carrying position a pair of corresponding walls of the scoops in a separating position move together in overlapping relationship and then separate again, a pulley fixed to each scoop, one of said pulleys being smaller in diameter than the other so that the relative speed with which each of the scoops pivots is different.

4,143,902

UTILITY UNIT FOR CAMPER VEHICLES

Thomas V. Johnstone, 13 Parkwood Crescent, Ottawa, Canada (K1B 3J4)

Filed Apr. 20, 1977, Ser. No. 789,045
Int. Cl.[2] B60P *3/34*
U.S. Cl. 296—167 **10 Claims**



1. A modular utility unit intended to replace removably an

exterior door at a corresponding door frame portion on a vehicle, said utility unit comprising: a modular, utility-component and appliance-containing, unit having an interior facade, a base, a top, sides and an exterior surrogate door panel, the surrogate door panel being correspondingly sized and shaped to conform substantially to the conformation of the door being replaced and in turn to be positioned at and to occupy substantially the same space normally occupied by the door with the remainder of the unit being positioned within the vehicle, utility appliances disposed within said modular utility unit in proximity to said surrogate door panel, and clamping means cooperating with the corresponding door frame portion of said vehicle for removably securing said modular utility unit within said vehicle.

4,143,903

MOUNTING APPARATUS OF DRIVER'S CAB FOR EARTH MOVING VEHICLE

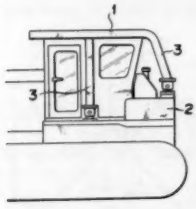
Shuji Yoshida, Sakai, and Hiroyoshi Kaihori, Hirakata, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jul. 22, 1977, Ser. No. 818,149

Claims priority, application Japan, Jul. 22, 1976, 51-96796[U]

Int. Cl.[2] B62D *27/04*

U.S. Cl. 296—35 R **3 Claims**



1. A mounting apparatus for a driver's cab for an earth moving vehicle comprising a body frame of the vehicle; a box-like bracket fixedly secured to said body frame, said box-like bracket having holes formed therein at one of the pairs of opposing side walls thereof;

a pair of rubber cushion members disposed in said box-like bracket, said rubber cushion members having concavities defining a space therebetween; a block disposed within the space defined by said rubber cushion members, said block having a threaded hole formed therein;

a frame for the driver's cab;

bold mounted for connecting said frame of the driver's cab to said box-like bracket; and

collar means mounted on said bolt means within the threaded hole of said block, said collar means having a threaded outer periphery so as to engage with the threaded hole of said block.

4,143,904

STATION WAGON TAILGATE

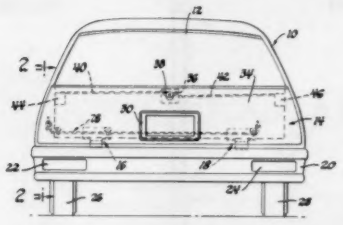
Norman F. Cooper, Mt. Clemens, and David N. Lee, Almont, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 27, 1978, Ser. No. 881,634

Int. Cl.[2] B62D *25/08*

U.S. Cl. 296—57 A **3 Claims**

1. In combination with a vehicle having a tailgate of the type pivotal about the bottom edge, a counterbalance spring assembly for providing an initial closing force assisting an operator in closing the tailgate followed by a kick-out force tending to push open the tailgate, said counterbalance spring assembly comprising: a torque rod with an elongated portion and stationary end portion mounted to said tailgate at a location above the pivotal axis thereof and in a manner permitting torsional winding of the elongated portion in one rotational direction; a second end of said torque rod extending substantially normal to the elongated portion to form a crank arm pivotal about the elongated portion during a winding and unwinding mode of operation; a link arm pivotally attached at one end to the vehicle and having an elongated slotted opening therein between said one end and another end; the second end of said torque rod defining a crank arm and engagement portion extending radially from the elongated portion and through said slotted opening capable of pivotal and sliding movement



therein as the tailgate pivots between open and closed positions; said link arm pivoting toward both the vehicle and the tailgate as the tailgate rotates toward the vehicle during a closing mode; contact bearing means on said tailgate to engage the link arm as the tailgate is pivoted to a substantially vertical orientation during the closing mode resultantly providing a fulcrum between the link arm's mounting and the position of its engagement with said torque rod which effectively exerts an opening force on the tailgate.

4,143,905

MOTOR-VEHICLE SEAT HINGE

Wolfgang Hensel, Langenfeld, and Paul Werner, Remscheid, both of Fed. Rep. of Germany, assignors to Keiper Automobiltechnik GmbH & Co KG, Remscheid-Hasten, Fed. Rep. of Germany

Filed Sep. 14, 1977, Ser. No. 833,337

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1976, 2641582

Int. Cl.[2] B60N *1/00*

U.S. Cl. 296—65 R **14 Claims**

1. In a motor-vehicle seat having a back part and a seat part and adapted to move normally in a predetermined direction of travel, a hinge comprising:

a first hinge element mounted on one of said parts;

a second hinge element mounted on the other of said parts and pivotal on said first hinge element about a pivot axis extending transverse to said direction of travel for forward pivoting of said back part in said direction of travel and backward pivoting of said back part against said direction of travel, said second hinge element being provided with an annular array of inwardly directed hinge teeth centered on said pivot axis;

a plurality of pawls spaced angularly about said pivot axis and each having an end provided with a generally axially extending pin defining a respective pawl axis and jour-

nalled in said first hinge element, each pawl being formed with outwardly directed pawl teeth meshable with said hinge teeth and with a front face directed angularly forwardly relative to said pivot axis;

cam means connected to said pawls for pivoting same about the respective pawl axes and thereby bringing said pawl teeth into and out of engagement with said hinge teeth for fixing and freeing said hinge elements relative to each other pivotally about said pivot axis; and

a formation adjacent each of said front faces and angularly fixed on said first hinge element, each of said formations having a rear surface closely angularly juxtaposed with the respective front face to such a side thereof that forward pivoting of said seat back with said teeth meshed urges each front face and the respective rear surface toward each other.

4,143,906

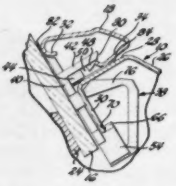
MOLDING CLIP

Neal N. Plourde, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 1, 1977, Ser. No. 829,727

Int. Cl.[2] B60J *1/02*

U.S. Cl. 296—84 D **4 Claims**



1. In a motor vehicle body having a fixed window panel, a vehicle body panel having a generally planar wall angular to the window panel and a lateral flange generally parallel to the window panel, and a reveal molding, a molding clip for mounting the reveal molding to conceal the juncture between the body panel and window panel, said molding clip comprising: a spacer portion interposed between the window panel and the lateral flange of the body panel to set the spacing therebetween and being held against movement relative to the window panel and lateral flange, an attachment portion overlying the planar wall, flexure means interconnecting the spacer portion and the attachment portion to normally bias the attachment portion toward the planar wall, and hook means on the attachment portion matingly engageable with the reveal molding, said flexure means permitting the attachment portion to shift relative to the planar wall and provide a bias resisting such movement, the flexure means permitting the movement of the attachment portion of the clip relative to the spacer portion of the clip during mating engagement of the reveal molding with the hook means of the attachment portion and biasing the attachment portion toward the planar wall to bias the reveal molding into engagement with the planar wall and thereby maintain the mating engagement between the hook means and the reveal molding.

4,143,907

ROOF MEANS FOR VEHICLES

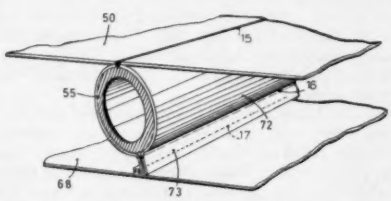
Alfred L. Ireland, Wolverhampton, England, assignor to Edward Rose (Birmingham) Limited, England

Filed Sep. 2, 1976, Ser. No. 719,726

Int. Cl.[2] B60J *7/06*

U.S. Cl. 296—137 C **8 Claims**

1. A method of manufacturing a folding roof means for a vehicle having a roof formed with an opening therein, said roof means comprising an outer cover of a flexible sheet material that is comprised of a plastics material, the cover being supported by a number of cross members extending beneath and transversely with respect to the cover, an inner lining of a flexible sheet material which extends beneath the cross members, and means for mounting the roof means on the vehicle with the cross members extending transversely of the opening in the roof thereof and for movement longitudinally of the opening between a position in which the cover and the lining are extended and close the opening, and a position in which the cover and the lining are collapsed to that the opening is open, which method includes, for at least one of the cross members, the steps of attaching by welding a strip of a flexible material that is comprised of a plastics material, directly to the inner face of the cover along abutting first attachment lines of the cover and the strip, the first attachment line of the cover being disposed transversely with respect to the cover and the first attachment line of the strip extending longitudinally of the strip intermediate its side edges thereby to provide two portions of the strip which extend away from opposite sides of the first attachment line of the strip towards the side edges; securing together the two portions of the strip along second attachment lines of the strip which extend longitudinally of the strip and are spaced from the first attachment line thereof and also from the respective side edges of the strip, thereby to form the strip into a tube between the first and second attachment lines thereof, the tube having two longitudinally extending flaps extending from said second attachment lines to the respective side edges of the strip; and attaching the flaps to the inner face of the lining along third attachment lines of the strip extending longitudinally of the strip adjacent to its side edges, the said tube being formed to receive the cross member whereby both the cover and the lining are connected to the cross member.



5. In a folding roof means for a vehicle having a roof formed with an opening therein, which roof means comprises an outer cover of a flexible sheet material that is comprised of a plastics material, a number of cross members extending beneath and transversely with respect to the cover for supporting the cover, an inner lining of a flexible sheet material which extends beneath the cross members, and means for mounting the roof means on the vehicle with the cross members extending transversely of the opening in the roof thereof and for movement longitudinally of the opening between a position in which the cover and the lining are extended and close the opening, and a position in which the cover and the lining are collapsed so that the opening is open, the improvement comprising a tubular pocket extending transversely with respect to the cover, the cover having an inner surface that is directly attached to the pocket and a flap extending between the pocket and the lining and connecting the lining to the pocket, the pocket and the flap being formed by a strip of a flexible material that is comprised of a plastics material, the strip having side edges, the strip being attached by welding to the cover along abutting first attachment lines of the cover and the strip, the first attachment line of the cover being disposed transversely with respect to the cover and the first attachment line of the strip extending longitudinally of the strip intermediate its side edges whereby the strip has two portions which extend away from opposite sides of the first attachment line of the strip towards the side edges, the two portions of the strip being secured together along second attachment lines of the strip extending longitudinally of the strip and spaced from the first attachment line thereof and also from the respective side edges thereby to form the tubular

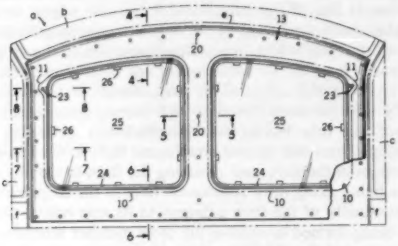
pocket between the first and the second attachment lines of the strip and the flap being the two sections of the strip extending from the second attachment lines, the lining having an inner face and the flap being attached to the inner face of the lining along third attachment lines of the strip extending longitudinally of the strip adjacent to the side edges; a respective cross member extending through the pocket.

4,143,908

WINDOWED T-TOP INSTALLATION FOR VANS AND THE LIKE

Michael D. Dix, Rte. 2, Box 316, Cedar Hill, Mo. 63016

Filed Sep. 12, 1977, Ser. No. 832,403
Int. Cl.[2] B60J 7/04
U.S. Cl. 296—137 B **6 Claims**



1. For installation over the forward portion of a vehicle having a crowned sheet metal vehicle, such roof having a pair of side-by-side cut-outs for receiving inward extending window rims, the forward outer corner of each cut-out having an outwardly extending notch,

a molded plastic fairing having crowned lateral edges, further having

a pair of window rim portions between said crowned edges and sized to fit within such cut-outs and formed downwardly to inward-extending window support ledges,

the fairing having a locally deepened section in registration with each such outwardly extending notch of the metal roof and extending from below the window support ledge surface, outwardly through the adjacent crowned lateral edge and

a drain passage formed through each said deepened section leading outward from the upper surface of said ledge, together with

a pair of window panes fitting removably within said window rim portions and supported on said ledges by gasket strips, each strip being continuous about its ledge and spaced inward from said rim portion,

whereby water entering between the edge of a window pane and the adjacent rim portion will be channeled by the gasket strip inwardly thereof to flow along said ledge to the forward outer corner thereof and to drain outward though the drain passage thereat.

4,143,909

WATER FILLED SEAT CUSHION

Lloyd McFarlin, P.O. Box 430, Brentwood, Calif. 94513

Filed Dec. 12, 1977, Ser. No. 859,582
Int. Cl.[2] A47C 27/08
U.S. Cl. 297—284 **11 Claims**

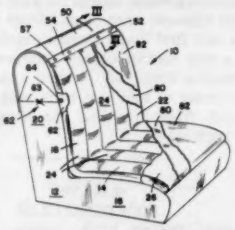
1. A seat cushion adapted to conform to the shape of a seat in a vehicle or the like such that a lower portion thereof rests on the seat bottom and an upper portion thereof is against the seat back, said cushion comprising:

a body portion formed of flexible resilient, fluid impervious sheet material, and including:

a lower fluid filled cavity;

an upper partially fluid filled cavity;

a plurality of seams positioned in said upper cavity and defined vertically along a substantial length of said cavity, said seams acting to define a plurality of secondary cavities within said upper cavity which are sealed from one another from fluid intercommunication except at the upper end thereof, for enabling fluid intermingling between said secondary cavities only at that point; and



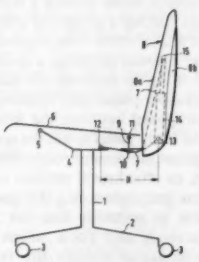
means removably attachable to said body portion for supporting said upper cavity against said seat back, said body portion positionable on a seat or the like such that said lower cavity and a portion of said upper cavity rests on said seat bottom, the rest of said upper cavity lying against said seat back.

4,143,910

CHAIR HAVING SYNCHRONOUSLY COUPLED TILTABLE SEAT AND BACK REST

Klaus Geffers, Goethestr. 26, and Fritz Drabert, Marienstr. 37, both of D-495 Minden, Fed. Rep. of Germany

Filed Sep. 12, 1977, Ser. No. 832,709
Int. Cl.[2] A47C 1/032
U.S. Cl. 297—301 **4 Claims**



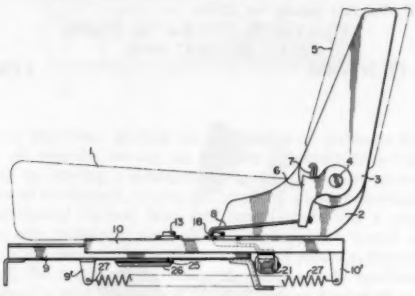
1. A chair comprising a seat support, a seat pivotally connected to said seat support at a first hinge point located adjacent the forward edge of said seat, a back rest support pivotably connected to said seat support at a second hinge point spaced from said first hinge point, linkage means between said seat and said back rest support operative to cause pivotal motion of said back rest support about said second hinge point to effect related pivotal motion of said seat about said first hinge point, a third hinge point adjacent the rear end of said seat support, said linkage means comprising a generally vertical connecting element having its upper end pivotally connected to said seat adjacent the rear edge of said seat and having its lower end pivotally connected to said back rest support at a location between said second and third hinge points, a fourth hinge point located on said back rest support above said third hinge point, said back rest support being substantially L-shaped and comprising a generally horizontal leg and a generally vertical leg, the free end of said generally horizontal leg being pivotally attached to said second hinge point at a location rearward of said first hinge point and forward of said third hinge point, said fourth hinge point being located near the free end of said generally vertical leg, an

elongated stored power element extending in a generally vertical direction and having a pair of opposing ends which are connected to said third and fourth hinge points respectively, and a back rest mounted on said back rest support, said back rest including a rear cover, said stored power element being concealed within said back rest between its forwardmost surface and said rear cover.

4,143,911
SEAT WALK-IN DEVICE FOR AUTOMOBILES

Yosihiro Sakakibara, Iwakura, and Takeshi Awano, Okazaki, both of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Imasen Denki Seisakusho, both of, Japan

Filed Nov. 1, 1977, Ser. No. 847,607
Claims priority, application Japan, Nov. 4, 1976, 51/148493
Int. Cl.² A47C *1/02*; B60N *1/02*
U.S. Cl. 297—341 **8 Claims**

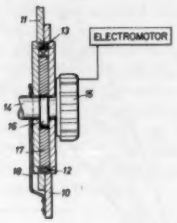


1. A seat walk-in device for automobiles with a front seat adjuster having a seat back tiltably fitted to a seat cushion, a sliding rail longitudinally fixed under the seat cushion, a stationary rail adapted to engage with the sliding rail and fixed on the automobile's floor and a seat position adjusting lock lever pivotally fitted to the sliding rail so as to releasably engage with a lock hole formed in the stationary rail, which comprises a control lever pivotally fitted to the sliding rail so as to rotate interlockingly with the tilting of the seat back, spring engaging means fitted to the free end of the rotating control lever so as to releasably engage with a guide member fixed to the stationary rail, a link piece pivotally interposed through pin members between the control lever and the lock lever and at least a spring member having one end hooked on said sliding rail and its other end hooked on at least one of said lock lever, said control lever and said link piece to urge the lock lever constantly to rotate toward the lock hole and the spring engaging means on the control lever constantly toward the guide member, wherein, on tilting forward the seat back, the lock lever is released from the lock hole in the stationary rail through the control lever and link piece against the urging force of the spring members to cause the sliding rail to slide, together with the seat cushion, toward the front of the automobile to increase the entering or leaving space for the rear sitter and, on sliding the seat cushion backward, the lock lever automatically engages with the lock hole, urged by the spring members, when the spring engaged means has moved to a predetermined position guided by the guide member.

4,143,912
ADJUSTABLE HINGE JOINT

Erich Krämer, Remscheid, Fed. Rep. of Germany, assignor to Manfred Schlappig, Frohnhausen, Fed. Rep. of Germany

Filed Mar. 25, 1977, Ser. No. 781,182
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1976, 2613195
Int. Cl.² A47C *1/025*
U.S. Cl. 297—362 **6 Claims**



1. A hinge joint for adjustment of the angle of inclination of the backrest of a seat, particularly in motor vehicles, comprising

a common axle having a handle,

a stationary articulated hinge lever and a pivotable articulated hinge lever pivotally supported with respect to each other about said common axle,

each of said hinge levers having an inner gear rim on sides thereof facing one another, said inner gear rims having equal diameters having equal root diameters and addendum diameters,

an eccentric on said common axle,

only a single disc constituting a toothed disc rotatably supported on said eccentric and with said eccentric being movable eccentrically about said common axle of both of said hinge levers, said toothed disc being jointly in engagement with said inner gear rims of said hinge levers and formed with a control opening complementary to said eccentric, the latter disposed freely rotatably complementarily in said central opening of said toothed disc, said toothed disc being movable in rolling contact on said inner gear rims by rotation of said eccentric, said toothed disc having an addendum diameter smaller by at least the height of one tooth than the root circle of said inner gear rims,

one of said inner gear rims having at least one tooth less than that of the other of said inner gear rims, and said toothed disc having at least one tooth less than that of said one inner gear rim with the smaller number of teeth.

4,143,913
SEAT BACK HINGE

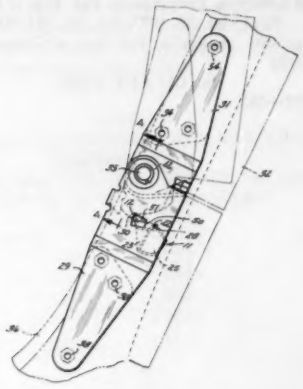
Robert J. Rumpf, Grosse Pointe, Mich., assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jul. 15, 1977, Ser. No. 815,918
Int. Cl.² B60N *1/02*
U.S. Cl. 297—379 **5 Claims**

1. An inertial seat back hinge lock element swingable in a bi-directional manner between a pair of fixed spaced-apart hinge plates having registering thrust buttresses and said lock element lockably engageable against a tooth on a movable hinge plate pivotally mounted between said fixed hinge plates, the lock comprising:

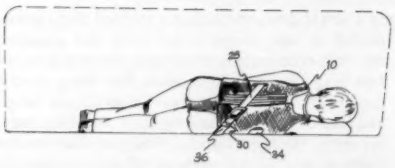
a pivotal pendulum between the fixed hinge plates having a body, a hardened pawl block insert, and integral trunnions, said pendulum swinging on said trunnions to engage said pawl block against said tooth of said movable hinge

plate and said pawl block including lateral extensions engageable with said thrust buttresses in said fixed plates



when said block is engaged with said tooth of said movable block.

4,143,914
SAFETY HARNESS
Susanne M. Klich, 1413 Autumn La., Cherry Hill, N.J. 08003
Filed Dec. 29, 1976, Ser. No. 755,192
Int. Cl.[2] A62B *35/00*
U.S. Cl. 297—389 6 Claims



1. A safety vest apparatus for restraining a child in a vehicle equipped with standard automotive seat belts comprising:

a nylon mesh fabric vest having a front portion, a left rear portion, and a right rear portion, said rear portions being integral with said front portion and thus seam-free in the shoulders;

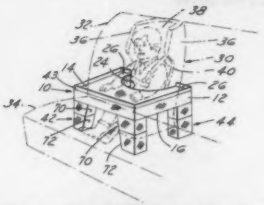
armholes between said front and each said rear portion; closure means for detachably fastening said right rear portion to said left rear portion;

a crotch strap integral with one of said front or rear portions and adjustably fastenable to the other of said rear or front portions of said vest; and

straps fixed to said front portion at each side of said vest immediately beneath each armhole at the bottom of the ribcage of the wearer and engageable with said automotive seat belts.

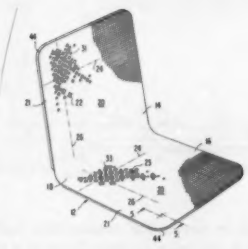
4,143,915
TABLE FOR A CHILD SAFETY SEAT
Sara K. Kamlay, 11825 Old Spring Rd., Louisville, Ky. 40223
Filed Dec. 5, 1977, Ser. No. 857,103
Int. Cl.[2] B60R *21/00*; A62B *35/00*
U.S. Cl. 297—390 18 Claims

1. A table for use by an infant sitting on a seat support comprising a panel-like top having upper and lower surfaces and being made from a resilient material, a plurality of legs depending from the lower surface of said panel-like top and being made from resilient material, and fastening means for each of said legs for removably securing the corresponding leg to the lower surface of said panel-like top, said legs being adapted to elevate the panel-like top above the seat support to permit the legs of the infant to extend under said panel-like top, each of said fastening means including a pair of interlocking members,



one of said members being secured to the lower surface of said panel-like top and the other of said members being secured to the top surface of the corresponding leg, said one member being armed with first interlocking loop and hook fabric material and said other member being armed with second interlocking loop and hook fabric material.

4,143,916
UNDER-BODY VENTILATING SEAT CUSHION
Herbert H. Trotman, and Helen H. Trotman, both of P. O. Box 807, Virginia Beach, Va. 23451
Filed Feb. 23, 1977, Ser. No. 771,094
Int. Cl.[2] A47C *23/00*
U.S. Cl. 297—453 9 Claims



1. A support panel for use as a ventilated body support member comprising

a plurality of protuberances arranged in columns and rows,

each of a plurality of the protuberances including a transversely extending portion and a longitudinally extending portion projecting from an intermediate portion to define a star-shaped element,

the transversely extending portion being disposed along a direction parallel to the direction of the rows and the longitudinally extending portion being disposed along a direction parallel to the direction of the columns,

the star-shaped elements extending between two spaced substantially parallel faces of the panel,

each of the star-shaped elements having a flat surface disposed in one of the faces and having wall portions extending from the periphery of the flat surface in the one face to the other face,

connecting portions collectively defining the other of the faces and extending between the wall portions in the other of said faces for connecting adjacent star-shaped elements,

the star-shaped elements in adjacent rows being staggered and intermeshed, with longitudinally extending portions of star-shaped elements along the direction of the rows being disposed between longitudinally extending portions of star-shaped elements in adjacent columns and transversely extending portions of star-shaped elements along

the direction of the rows being disposed between adjacent transversely extending portions of star-shaped elements in adjacent rows,

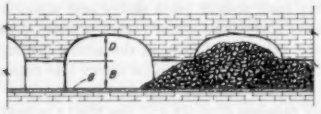
the star-shaped elements providing a lattice of elongate channels each extending about the periphery of an associated star-shaped element and oriented parallel to one of the directions of the rows and columns with the continuity between said channels aligned along the directions parallel to said rows and columns being repeatedly interrupted by said star-shaped elements, whereby the stiffness of the panel is enhanced and excessive flexing thereof is prevented along all directions along said panel including the longitudinal and transverse directions of said columns and rows respectively when a body is supported on the member, and said channels are provided to permit the flow of ventilating air therethrough.

4,143,917

IN-SITU RETORTING OF OIL SHALE WITH IN-SITU FORMED ARCHES

Glenn A. Sweany, Stamford, Conn., assignor to Continental Oil Company, Ponca City, Okla.

Filed Oct. 11, 1977, Ser. No. 841,184
Int. Cl.[2] E21B *43/24*
U.S. Cl. 299—2 **1 Claim**



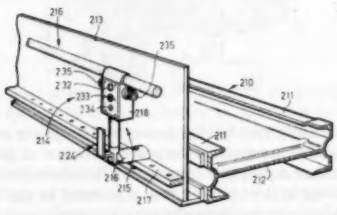
1. An improved method for recovering oil products from shale oil deposits having an exposed substantially vertical surface by driving a substantially horizontal tunnel under a portion of the deposit, sloping the tunnel to a tunnel opening in the substantial vertical face, said tunnel containing a sump, explosively rubblizing the roof and walls of the tunnel and fireflooding the rubblized zone to retort oil products from the deposit, the improvement comprising explosively rubblizing the tunnel in sections to form retort chambers having an arch of non-rubblized shale between chambers so as to force retort gases toward the bottom of the rubblized zone to increase combustion and enhance recovery of oil shale combustion products.

4,143,918

MINING CONVEYOR ASSEMBLIES WITH CONTROL BOXES ON FENCE

William Murday, Kimberley, England, assignor to Winster Mining Limited, England

Filed Feb. 4, 1976, Ser. No. 655,204
Int. Cl.[2] E21C *35/12*
U.S. Cl. 299—43 **7 Claims**



1. In a mining conveyor assembly comprising:

a conveyor which in the use of the assembly extends alongside a mine face,

an elongate wall connected to and upstanding from the conveyor, the wall being so comprised and being of such materials that the wall has the characteristic that it is relatively unyielding under externally applied forces, and

a fence structure secured in space relation to the wall to provide a trough defined between the wall and the fence structure,

the improvement comprising:

the fence structure comprising a plurality of longitudinally-spaced upright elements which are so comprised and of such materials that they have the characteristic that they are yieldable to externally applied forces in a direction laterally of the fence structure;

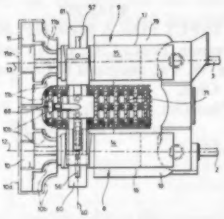
at least some of the upright elements being provided with a control chamber adapted to contain and enclose a control unit for controlling the conveyor and a respective control unit mounted in and enclosed by each such control chamber for controlling the conveyor and for transmitting a signal to a control station of the conveyor and means accessible from the exterior of said chamber for operating the control unit mounted therein.

4,143,919

MINING MACHINERY WITH GUIDEWAY FOR RELATIVELY MOVABLE CUTTING UNITS

Gordon B. Dawson, Hulland Ward, England, assignor to Atlow Mining Development Consultants Limited, Derbyshire, England

Filed Oct. 4, 1977, Ser. No. 839,177
Claims priority, application United Kingdom, Oct. 9, 1976, 42082/76; Jul. 7, 1977, 28521/77
Int. Cl.[2] E21C *27/24*
U.S. Cl. 299—59 **10 Claims**



1. A mining machine comprising two cutting units each including a rotatable cutting head having cutting faces directed forwardly and rearwardly with respect to the direction of movement of the machine and an elongated housing incorporating a drive mechanism for the cutting head extending along the axis of rotation of the cutting head the cutting units being mounted side-by-side with the cutting heads adjacent each other, each housing being movable about a vertical axis towards the end of the housing remote from the cutting head and about a transverse horizontal axis between the vertical axis and the cutting head, means for moving the cutting units about the said axes, the housings of said two cutting units being mounted on a common horizontal slideway, and said slideway defining the transverse horizontal axis about which said cutting units may be pivoted.

4,143,920

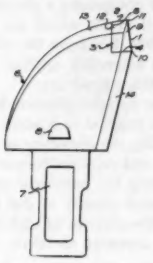
MINERAL CUTTING PICK INSERT SHAPE

John W. Haddock, Sheffield, England, assignor to Hall & Pickles Limited, Sheffield, England

Filed Mar. 7, 1978, Ser. No. 884,217
Claims priority, application United Kingdom, Mar. 7, 1977, 09576/77
Int. Cl.[2] E21C *35/18*
U.S. Cl. 299—79 **10 Claims**

1. A mineral cutting pick of the type adapted to be traversed relative to a mineral face and having a leading cutting edge and

an outer cutting edge incorporated in a hard metal insert mounted in a rebate formed by a pair of seating surfaces at the end of a pick body remote from a shank for use in securing in a socket of a chain or drum or the like, at least one end of the leading cutting edge adjacent the outer cutting edge having



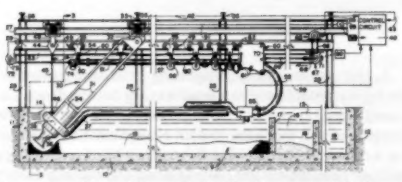
negative rake with respect to the shank, and the leading cutting edge being defined by surfaces the angle between which increases from the position at which it will make foremost contact with the mineral face to the end of the leading cutting edge adjacent the outer cutting edge.

4,143,921

SLURRY INPUT FOR A MULTIPLE FEED SUMP

William T. Sweeney, Ponca City, Okla., and Thomas H. Plate, Morgantown, W. Va., assignors to Continental Oil Company, Ponca City, Okla.

Filed Oct. 13, 1977, Ser. No. 842,011
Int. Cl.[2] B65G *53/30*
U.S. Cl. 302—14 **5 Claims**



1. Apparatus for uniformly distributing material along the length of a sump comprising:

a. support means mounted above and along the length of said sump;

b. dredge means movably attached to said support means and having an inlet positioned in said sump;

c. flexible means having an inlet and an outlet and extending over said sump and connected through an arcuate bend to a pipe at the inlet end of said sump;

d. discharge outlet means positioned over said sump and coupled to said outlet end of said flexible hose;

e. means for movably supporting said discharge outlet means, said flexible hose, and said arcuate bend to said support means,

f. means for moving said discharge means and flexible pipe along the length of said sump; and

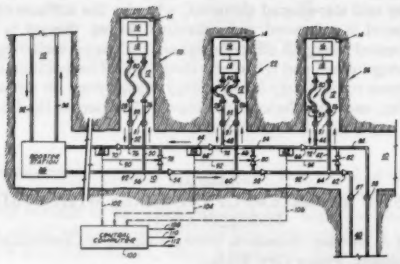
g. position apparatus means coupled between said dredge means and said discharge outlet means to determine the position of each so that material is not discharged from said discharge means in the proximity of the inlet of said dredge means.

4,143,922

METHOD OF MULTIPLE POINT INJECTION FOR SLURRY PIPELINES

William T. Sweeney, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Jan. 12, 1978, Ser. No. 868,925
Int. Cl.[2] B65G *53/30*
U.S. Cl. 302—14 **8 Claims**



1. A method for injecting particulated solids from more than one source into a slurry and water return primary pipeline system, comprising the steps of:

connecting each source via a slurry and water line to said respective slurry and water return primary pipelines; and

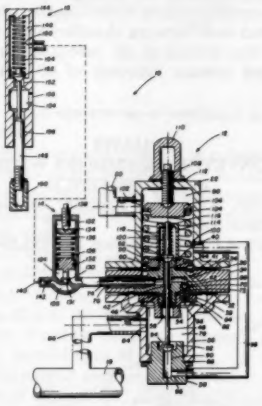
sensing the velocity of flow of the slurry primary pipeline downstream from each source slurry line connection and controlling the velocity of flow of water from the water primary pipeline directly into the slurry primary pipeline in approximate inverse proportion thereto.

4,143,923

BRAKE CONTROL APPARATUS FOR RAILWAY CARS

William R. King, 1909 Sunshine Sq., Longview, Tex. 75601

Filed Mar. 7, 1977, Ser. No. 775,379
Int. Cl.[2] B60T *8/18*
U.S. Cl. 303—22 R **58 Claims**



1. For railway cars having sprung and unsprung portions, a brake control apparatus interposed between a pressurized brake pressure supply line connected to a train brake valve and a pressurized brake cylinder line connected to the brakes of each railway car for transmitting a pressure drop signal received from the train brake valve to the railway car brakes, said apparatus comprising:

means defining a first chamber having a port connected to the brake pressure supply line for receiving the pressure drop signal from the train brake valve;

means defining a second chamber having a port connected to the brake cylinder line for transmitting a predetermined pressure drop signal to the railway car brakes;

diaphragm means movably abutting said first and second chambers with surfaces of different cross sectional areas;

means for applying a predetermined bias to the diaphragm means;

first normally closed valve means mounted on the diaphragm means and responsive to a predetermined positioning thereof for permitting fluid flow through the diaphragm means between the first chamber and the second chamber and thereby effecting a first predetermined relationship between the pressure drop in the brake pressure supply line effected by the train brake valve and the pressure drop transmitted through the brake cylinder line to the railway car brakes;

strut cylinder means connected to at least one of said first and second chamber means and including a housing and an extending strut mounted for translation therein, said strut being responsive to the relative positioning of the sprung and unsprung portions of the railway car, which positioning corresponds to the particular railway car loading condition;

second valve means disposed in the strut cylinder means and responsive to the positioning of the strut cylinder means for effecting a second predetermined relationship between the pressure drop in the brake pressure supply line effected by the train brake valve and the pressure drop transmitted through the brake cylinder line to the railway car brakes; and

first check valve means interconnecting the first and second chambers and responsive to a pressure differential therebetween to effect equalization upon a pressure rise in the brake pressure supply line so that the railway car brakes can be released.

4,143,924

LOAD-SENSING VALVES

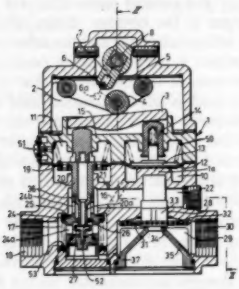
Ralph Coupland, Lincoln, England, assignor to Clayton Dewandre Company Limited, Lincoln, England

Filed Mar. 11, 1977, Ser. No. 776,670

Claims priority, application United Kingdom, Apr. 2, 1976, 13458/76

Int. Cl.² B60T 8/18

U.S. Cl. 303—22 R **7 Claims**



1. A load-sensing valve for use in an air pressure braking system for a vehicle and including an inlet port for connection to a source of air pressure and a delivery port for connection to the vehicle brake actuators, comprising a rockable beam having a fulcrum, first fluid pressure responsive diaphragm means operatively connected to one arm of said beam, second fluid pressure responsive diaphragm means operatively connected to the other arm of said beam, a two-stage valve assembly arranged for controlling communication between said inlet and delivery ports; said two-stage valve assembly comprising a movably mounted hollow inlet valve element coacting with a fixed seating, a pilot valve element coaxially and movably mounted within said hollow inlet valve element and coacting with a seating in said hollow inlet valve element, and a plunger coaxial with said valve elements attached to said second fluid pressure responsive diaphragm means, said plunger having a longitudinally movable connection with said inlet valve element and having a part extending through said inlet valve element for operative connection to said pilot valve element, a first resilient means for biasing said inlet valve element onto its seating, a second resilient means for biasing said plunger into a motion transmitting connection with said inlet valve element and to displace and normally hold said pilot valve element off its seating under conditions of small or no brake operating air pressure, said first resilient means being of sufficiently greater strength than said second resilient means that said inlet valve element is not displaced from its seating by the force of said second resilient means, means operative when brake operating air pressure is effective through said inlet port for supplying air pressure at inlet pressure to said first diaphragm means and air pressure at delivery pressure to said second diaphragm means, means in the connection between said plunger and said valve elements whereby when said brake operating air pressure is below a predetermined value said inlet valve element remains seated while said pilot valve element remains open whereas when said brake operating air pressure exceeds said predetermined value said plunger is displaced by said beam and moves said inlet valve element off its seating, and means for displacing said fulcrum in response to variations in vehicle load.

4,143,925

VEHICLE FLUID PRESSURE BRAKING SYSTEM

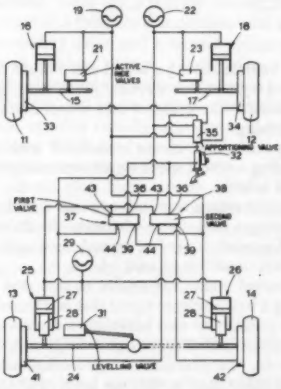
Alastair J. Young, Kenilworth, England, assignor to Automotive Products Limited, Warwickshire, England

Filed Jan. 11, 1978, Ser. No. 868,692

Claims priority, application United Kingdom, Jan. 14, 1977, 01519/77

Int. Cl.² B60T 8/18

U.S. Cl. 303—22 R **3 Claims**



1. A vehicle braking system of the kind in which a first valve is interposed between a driver-controlled source and a brake acting on a first wheel of the vehicle and a second valve is interposed between the driver-controlled source and a second brake acting on a second wheel transversely opposite the first wheel, the pressure supplied to the first brake being modulated by the first valve in accordance with the vertical load supported by the first wheel and the pressure supplied to the second brake being modulated by the second valve in accordance with the vertical load supported by the second wheel such that the fluid pressure supplied to each brake is less when the vertical load supported by the respective wheel is relatively low than when the vertical load is relatively high, each valve comprising an inlet port connected to the driver-controlled source, an outlet port connected to the respective

brake, a control port for connection to part of a fluid suspension system on the vehicle which can supply a pressure which depends on the load carried by the respective wheel, a plunger movable by pressure at the outlet port in a direction which closes communication from the inlet port to the outlet port and a piston having a piston area thereon which is subject to pressure at the control port to create a biassing force which acts on the plunger to bias the plunger in the other direction, wherein each valve further comprises an auxiliary control port for connection to another part of the suspension system and an auxiliary piston area on the piston connected to the auxiliary control port so that pressure in said other part of the suspension system can modify the biassing force on the plunger such that the resultant biassing force is substantially proportional to the load carried by the respective wheel under all driving conditions.

4,143,926

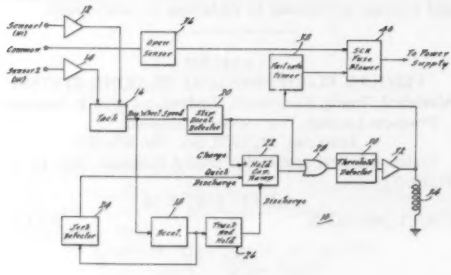
SKID CONTROL SYSTEM

Roger L. Miller, Ann Arbor, Mich., assignor to Kelsey-Hayes Co., Romulus, Mich.

Continuation-in-part of Ser. No. 763,060, Jan. 27, 1977, abandoned. This application Sep. 9, 1977, Ser. No. 831,770

Int. Cl.[2] B60T *8/02*

U.S. Cl. 303—92 **24 Claims**



1. For a vehicle having a wheel and a brake for the wheel, a skid control system for cyclically releasing and reapplying brake pressure to the brake of said wheel during a skid condition, comprising:

wheel speed sensor means associated with said wheel for providing a wheel speed signal representative of the speed of said wheel;

skid detector means responsive to said wheel speed signal for producing a skid signal whenever the deceleration of said wheel exceeds a predetermined threshold rate indicative of a skid condition at said wheel;

brake control means responsive to said skid signal for producing a brake release signal that is effective to relieve the brake pressure to said brake of said wheel;

timing means including charge storage means and charging means for charging said charge storage means in response to said skid signal so that the level of charge achieved by said charge storage means is related to the duration of said skid signal, said timing means producing an output signal in accordance with the level of charge on said charge storage means that is provided to said brake control means for maintaining said brake release signal beyond the termination of said skid signal whenever the charge on said charge storage means exceeds a predetermined level; and

acceleration means responsive to said wheel speed signal for producing a wheel acceleration signal representative of the acceleration of said wheel that is provided to said charging means for varying the charge rate of said charge storage means, said acceleration means including hold circuit means responsive to said wheel acceleration signal for producing a peak acceleration signal representative of the maximum acceleration attained by said wheel when brake pressure is relieved, said peak acceleration signal being provided to said charging means for varying the charge rate of said charge storage means.

4,143,927

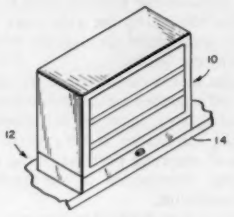
CASSETTE LOCKING DEVICE

Harry W. Spear, Southborough, and Peter J. Coppola, Somerville, both of Mass., assignors to Market Forge, a division of Beatrice Foods Co., Everett, Mass.

Filed Oct. 21, 1977, Ser. No. 844,270

Int. Cl.[2] A47B *96/06*

U.S. Cl. 312—196 **6 Claims**



1. In combination with a storage cabinet of predetermined horizontal section provided at its bottom at two opposite sides with flanges extending along the sides and inwardly from the sides, said flanges being spaced downwardly from the bottom and parallel thereto, of a security mount for locking the storage cabinet to a table or countertop, said mount comprising a rigid base frame of corresponding horizontal section having sides coextensive with said two opposite sides of the cabinet, flanges along the two opposite sides of the base extending inwardly therefrom on which the flanges at the bottom of the cabinet are adapted to rest to support the cabinet on the base frame, said flanges on the base frame defining an opening at the top of the base frame beneath the bottom of the cabinet, flanges along the sides and ends of the base frame at the bottom thereof extending inwardly from the sides and ends, said flanges containing holes for receiving fastening means from inside the base frame into the supporting table or counter to bolt the base frame down, locking flanges mounted on the base frame in upwardly-spaced relation to the base flanges, said locking flanges defining along said side horizontal grooves for receiving the flanges at the bottom of the cabinet such that said locking flanges overlie the flanges at the bottom of the cabinet, one of said locking flanges being stationary and the other movable relative to the one to retract it from a locking position overlying the flange at the bottom of the cabinet at that side to a position withdrawn from said overlying position, said movable locking flange being mounted to the base frame on a bar supported transversely of the base frame for movement transversely of the base frame, and a lock mounted to a side of the base frame in a position of alignment with an end of the bar such that movement of the lock to a locking position moves the bar transversely within the base frame which, in turn, moves the movable locking flange into a position overlying the flange at the bottom of the cabinet at that side, said structure being such that all of said flanges are concealed within and between the bottom of the cabinet and the base frame and, hence, are inaccessible to disengagement except by destruction of the cabinet and/or base frame.

4,143,928

ANIMAL PRODUCTION CYCLE PROGRAMMER

Harlan J. Easton, R.R. 3, Blooming Prairie, Minn. 55917

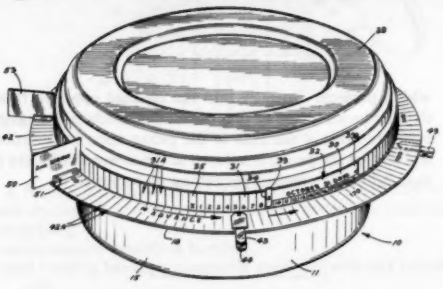
Filed Nov. 25, 1977, Ser. No. 854,666

Int. Cl.[2] A47B *63/00*

U.S. Cl. 312—197 **9 Claims**

1. A programming device for control of a program of treatment or operation relative to individual subjects represented on control cards and on which a plurality of programmed

operations are to be performed comprising a housing, stationary means on said housing defining a plurality of slots for receiving control cards, each card representing one of the subjects, said slots being generally oriented in a radial direction from the central portions of the housing and having a width in annular direction, a rotationally movable annular program member having a plurality of program segments, at least some of said program segments representing a program operation and one of said segments being a reference segment, means on the housing for supporting said annular program member in position with each program segment associated with one of the slots in each position of the program member as the program member is moved relative to the housing, the program segments on the program member having an annular width substantially equal to the annular width of portions of said slots



adjacent said program member, means to releasably secure said movable program member with respect to said housing, and means releasably secured relative to said program member and said housing for indicating the month and day during which the program is operated, said means indicating month and day including a day segment for each of said days corresponding generally in annular width to the segments of the program member and being positioned adjacent said program member whereby when the program member reference segment is advanced relative to the housing a distance equal to a day segment the program member advances a distance substantially equal to the width of adjacent portions of one of said slots, and each program segment advances to the next slot to indicate the programmed operation to be performed that particular day on the subjects whose cards are in the slot aligned with that program segment.

4,143,929

CURRENT COLLECTOR

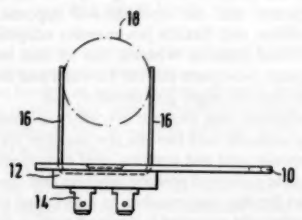
Jürgen Boje, Frankfurt am Main; Horst Bratengeier, Neu-Isenburg; Karel Zaveta, Münster, and Günter Schumann, Ober Roden, all of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 21, 1977, Ser. No. 789,402

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1976, 2618782

Int. Cl.[2] H01R *39/00*

U.S. Cl. 339—5 M **7 Claims**



1. In a current collector for the photoscope of a photoelectric control installation which is provided in a flame cutting machine, consisting of an insulating plate which is provided on one side with a mounting for electric plugs and on the other side with contact wires which are electrically connected with the plugs, characterized by the fact that said contact wires are arranged in a single row, said contact wires having free springy ends taken up by a comb, said comb being formed by a plurality of pins, and each of said contact wires being disposed between a respective pair of said pins.

4,143,930

SWIVEL CONNECTION

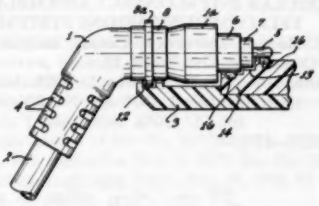
Friedrich Schauer, Heroldsberg, Fed. Rep. of Germany, assignor to Kabel-und Metallwerke Gutehoffnungshütte Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Mar. 28, 1977, Ser. No. 781,535

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1976, 2612262

Int. Cl.[2] H01R *39/00*

U.S. Cl. 339—6 R **6 Claims**



1. Swivel coupling for connecting and feeding through an electrical connection that includes a cable, into and through a housing of a piece of electrical equipment, appliance, tool, or the like, comprising:

an integral member made of relatively strong insulating material and having a first, annular portion with a radially outwardly extending ridge and a second cylindrical portion serving as contact carrier, there being a pair of contacts mounted on said cylindrical portion in concentrical relation thereto, and to each other, said member having an internal opening radially opposite said ridge, said opening receiving the ends of conductors of the cable for connection to the contacts; and

relatively soft plastic plug body means molded onto the member to embed the ends of the conductors and the connection of the conductors to the contacts as penetrating said opening, but leaving the outer surface of the first annular portion and the ridge exposed.

4,143,931

FLEXIBLE CONDUCTOR STRIPS FOR MINIATURIZED ELECTRICAL SYSTEMS

Vern E. Skare, Marion, Iowa, and Dana D. Sokol, Rochester, Minn., assignors to Cir-Kit Concepts, Inc., Rochester, Minn.

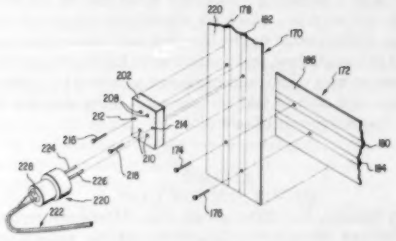
Filed Jan. 28, 1977, Ser. No. 763,670

Int. Cl.[2] H05K *1/08, 1/14;* F21V *33/00;* H01B *11/02*

U.S. Cl. 339—17 F **3 Claims**

1. In a miniaturized electrical system, a plurality of electrical components each having a strip of double-sided adhesive provided on an outer side thereof with a pair of spaced apart and exposed metal conductor foils, flexible conductor strip means having a single-sided adhesive strip provided with a pair of spaced apart and exposed metal conductor foils adapted to overlap and contact the foils of said electrical components, and at least one wall outlet member comprising a printed circuit board chip having spaced conductor strips on one side thereof and spaced apart similarly to the foils of said conductor strip means, said chip having a plated-through hole associated with each conductor strip thereof, a metal brad for passing through

each such hole and a foil of the conductor strip means to make electrical contact therewith, and said chip also having a pair of



plug-receiving plated through holes electrically connected with a respective strip.

4,143,932

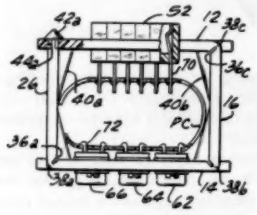
MODULAR INTERCONNECT ASSEMBLY FOR TELECOMMUNICATIONS SYSTEMS

Kamal S. Boutros, Downsview, Canada, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 760,909, Jan. 21, 1977, abandoned. This application Feb. 2, 1978, Ser. No. 874,610

Int. Cl.[2] H05K *7/10, 3/32*

U.S. Cl. 339—17 F **28 Claims**



1. In a modular interconnect terminal of use in establishing electrical interconnections, a body to serve as a frame, comprising as integrally formed

a first panel and a second panel, and

a plurality of integral, elongated struts extending between and interconnecting one side of the first panel with one side of the second panel, each end of each said strut being secured to an adjoining panel by hinge means associated with said strut to enable said strut and said adjoining panel to be folded relative to each other,

each said hinge means including slots disposed in said adjoining panel on each side of said strut to extend said strut into said panel, and a transverse scoring groove disposed in the surface of said strut between said slots.

4,143,933

SAFETY SLEEVE FOR ATTACHMENT TO THE PRONG OF AN ELECTRICAL CONNECTOR AND KEY FOR ITS REMOVAL

Richard L. Aitkins, 4525 17th St., N.W., Puyallup, Wash. 98371

Filed Sep. 6, 1977, Ser. No. 830,571

Int. Cl.[2] H01R *13/44*

U.S. Cl. 339—37 **11 Claims**

1. A sleeve for attachment to a prong of a male electrical connector of the type having a hole in the surface of the prong to prevent insertion of the connector in a female connector comprising:

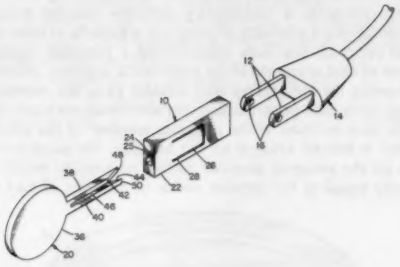
(a) a housing having a central channel communicating with either end of the housing permitting the insertion of the prong in one end and a key in the opposite end;

(b) a first flexible arm connected to the housing;

(c) a first locking stud attached to the first flexible arm which projects centrally into the channel for engagement in the hole in the prong upon its insertion;

(d) a second flexible arm connected to the housing; and

(e) a second locking stud attached to the second flexible arm



which projects centrally into the channel opposite from the first locking stud so that the locking studs each engage opposite sides of the hole in the prong upon its insertion and so that the prong is secured in the sleeve until a key is inserted in the channel permitting its removal.

4,143,934

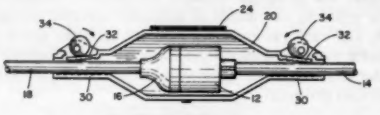
SOCKET AND PLUG HOLDER

Howard L. Siebert, 48 Humboldt Pkwy., Williams Bay, Wis. 53191

Filed Dec. 21, 1977, Ser. No. 862,867

Int. Cl.[2] H01R *13/54, 13/58*

U.S. Cl. 339—75 P **6 Claims**



1. A holder for maintaining an electrical connection between a socket of a first electrical cord and a plug of a second electrical cord, said holder comprising, in combination:

a housing having a lower section and an upper section hingedly attached thereto, said upper section and said lower section cooperatively defining a space for receiving said plug and socket and further defining two openings into said space for passage of said cords;

a rigid jaw member integrally molded on said housing adjacent one of said openings;

a flexible jaw member integrally molded on said housing adjacent said one opening and opposite said rigid jaw member, said flexible jaw member adapted to be flexed to a flexed position wherein one of said cords is clamped against movement thereof between said flexible jaw member and said rigid jaw member; and

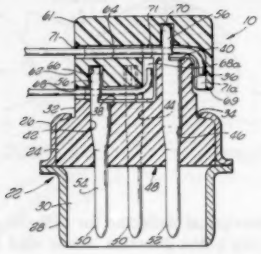
an eccentric cam member pivotably mounted on said housing adjacent said flexible jaw member on the side thereof opposite said one opening, said cam member being pivotable to a pivoted position wherein said cam member forces said flexible jaw member to said flexed position;

whereby said one cord is clamped against movement thereof and the electrical connection between said socket and said plug is maintained against tension in said one cord.

4,143,935
ELECTRICAL CONNECTOR

David S. Goodman, Mission Viejo; James H. Curley, Costa Mesa, and Jack E. Langenbach, Newport Beach, all of Calif., assignors to International Telephone and Telegraph Corp., New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 885,755
Int. Cl.[2] H01R 13/38
U.S. Cl. 339—99 R 6 Claims



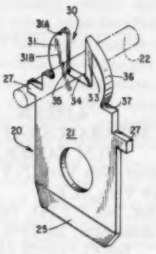
1. An electrical connector for two layers of conductors, with each conductor having a metallic core covered by insulation, comprising;
an elongated insulative housing;
said housing having a conductor receiving side and a mating side;
three, generally parallel, spaced rows of contact receiving cavities in said housing extending from said conductor receiving side to said mating side;
contacts mounted in said cavities, each said contact having a contacting section on said mating side and a termination section on said conductor receiving side;
the termination sections of the contacts in one row being at a different level from the termination sections of the contacts in the other rows;
the termination sections of the contacts in said other rows being staggered relative to each other;
said termination section of each said contact embodying insulation piercing, core penetrating jaws;
a first insulative cap removably mounted on said conductor receiving side of said housing;
said first cap embodying means for forcibly inserting portions of one of the conductors of one of said layers of conductors into said jaws of said contacts in said one row;
a second insulative cap removably mounted on said conductor receiving side of said housing; and
said second cap embodying means for forcibly inserting portions of the conductors of the other layer of conductors into said jaws of said contacts in said other rows.

4,143,936
ELECTRICAL CONTACT

Robert DeRoss, Cicero, and Leonard Kaczmarek, Wonder Lake, both of Ill., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Dec. 1, 1977, Ser. No. 856,428
Int. Cl.[2] H01R 11/08
U.S. Cl. 339—276 T 16 Claims

1. An electrical contact adapted to be crimped to an electrical conductor, said contact comprising
a body portion having an active contact element disposed at one end for engagement with a compatible contact and a terminal element at the other end adapted to be fixedly connected to a conductor,
said terminal element comprising a pair of spaced crimping arms disposed in a common plane, said arms including inside facing edges having beveled surfaces offset relative to one another such that upon crimping of said arms the beveled surfaces provide a camming action permitting said arms to pass one another to encapsulate the conductor while said arms remain in substantially the same plane, whereby the crimped arms provide a positive mechanical

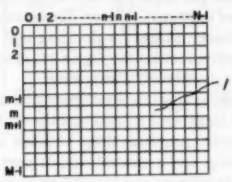


and electrical interconnection between the contact and the conductor.

4,143,937
PHASE SHIFTER FOR HOLOGRAM RECORDING

Susumu Yonezawa, Kodaira; Yasuhiro Torii, Hachioji; Haruo Ogiwara, Tokorozawa, and Gisaku Nakamura, Mitaka, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 612,962, Sep. 12, 1975, abandoned. This application Nov. 8, 1977, Ser. No. 849,580
Claims priority, application Japan, Sep. 14, 1974, 49/105500; Oct. 16, 1974, 49/118009
Int. Cl.[2] G03H 1/02, 1/16; G02B 5/00
U.S. Cl. 350—3.82 3 Claims



1. A phase shifter for hologram recording comprising a number of unit cells arranged in a matrix shape and formed by a transparent dielectric film applied on a transparent plate, the improvement comprises that the unit cells are arranged at locations corresponding to a phase distribution satisfying the following conditions:

$G(m, n) = G_M(m)G_N(n)$

$m = 0, 1, 2, \ldots, M\text{-}1$ (number of rows)

$n = 0, 1, 2, \ldots, N\text{-}1$ (number of columns)

$$G_M(m) = \begin{cases} G_m(a) & (m = a) \\ X_m(m-a) & (m \neq a) \end{cases}$$

$$G_N(n) = \begin{cases} G_N(b) & (n = b) \\ X_N(n-b) & (n \neq b) \end{cases}$$

wherein, G(m, n) is the complex amplitude transmission of a unit cell of mth row and nth column,

M, N are 1 or odd prime numbers, but if M or N equal 1, then N or M is greater than 1,

M, N are 1 or odd prime numbers

a is a certain definite integer among $0, 1, 2, \ldots, M\text{-}1$,

b is a certain definite integer among $0, 1, 2, \ldots, N\text{-}1$,

$\chi_L(P)$ is a primitive character when the modulus is L,

$|G_M(a)| = 1$ or 0

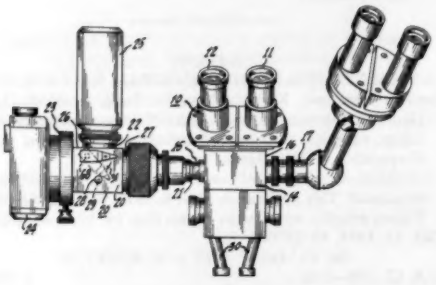
$|G_M(b)| = 1$ or 0
however, if priority is to be decided, 0 has the priority.

4,143,938

MICROSCOPE APPARATUS WITH TELEVISION AND FILM CAMERAS

Richard E. Feinbloom, New York, N.Y., assignor to Designs for Vision, Inc., New York, N.Y.

Continuation of Ser. No. 771,181, Feb. 23, 1977, abandoned. This application Mar. 20, 1978, Ser. No. 888,349
Int. Cl.[2] G02B *23/02*
U.S. Cl. 350—19 14 Claims



1. A microscope apparatus including means producing a parallel beam of light rays from an illuminated object in a given orientation, a beam splitter for dividing said beam of light and directing a portion thereof through a beam splitter port, and an optical coupler apparatus, comprising:

(a) a housing having an input port and a first output port relatively transverse to said input port, said input and first output ports communicating with an internal hollow of said housing, and a second output port relatively coaxial with said input port and located on an opposite side of said housing, said input port coupled to said beam splitter port for receiving said beam of light,

(b) a first lens positioned at said input port to cause said light beam directed through said port to be converged by said lens,

(c) a second lens positioned at said second output port to cause light directed and converged by said first lens to diverge at said port,

(d) a mirror having a first and second selectable position, said mirror pivotally mounted on said housing and positioned in said internal hollow between said input and second ports and said mirror operating when in said first position to reflect light from said first lens solely to said first transverse port and when selected in said second position, to block said first port to cause said light directed from said input port to pass through said second lens at said second output port,

(e) a television camera coupled to said transverse port for receiving said beam of light as converged by said first lens at a par focal registration when said mirror is operated in said first position, to cause said camera to receive said beam of light absolutely indicative of the given orientation of the image of said object and solely as due to the operation of said first lens and said mirror,

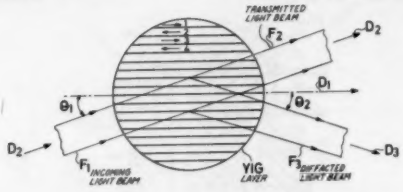
(f) a film camera coupled to said second output port for receiving said beam of light at par focal registration when said mirror is operated in said second position and solely due to the operation of said first and second lens.

4,143,939

MAGNETO OPTICAL DEFLECTOR

Bernard Desormiere; Georges Hepner, and Jean-Paul Castera, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 28, 1977, Ser. No. 810,783
Claims priority, application France, Jul. 2, 1976, 76 20255
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.13 10 Claims



1. A magneto-optical deflector for deflecting an incident light beam having a first direction into at least one emerging beam having a deflected direction slightly variable about a fixed second direction, which comprises:

a thin layer of homogeneous magnetic material having oppositely magnetized stripe domains, said domains extending along a third direction parallel to the layer;

means for applying to said layer a magnetic field parallel to said third direction; the spacing of the domains being dependent upon the value of said field; and

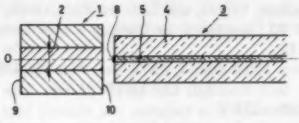
means for entering said incident beam into said layer, and means for extracting said emerging beam from the layer.

4,143,940

DEVICE FOR COUPLING A RADIATION SOURCE TO A MONOMODE OPTICAL TRANSMISSION FIBER WITH THE AID OF A RESONANT CAVITY

Giok D. Khoe, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 683,536, May 5, 1976, abandoned. This application Mar. 7, 1978, Ser. No. 884,374
Claims priority, application Netherlands, May 9, 1975, 7505451
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.15 4 Claims

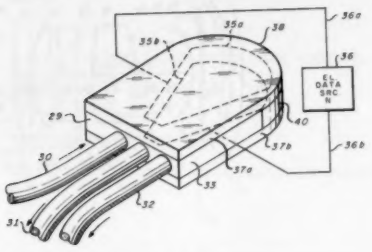


1. In combination, a laser radiation source having a resonant cavity bounded by oppositely disposed mirrors defining an optical axis, a monomode optical transmission fiber having a light transmissive core axially aligned with the optical axis of the laser radiation source, and a reflecting layer on the optical axis of the laser covering the core of the end of the monomode optical transmission fiber which adjoins one mirrored end of the resonant cavity for stimulating the lowest-order transveral mode for the laser radiation source.

4,143,941
LOW LOSS OPTICAL DATA TERMINAL DEVICE FOR MULTIMODE FIBER GUIDE OPTICAL COMMUNICATION SYSTEMS

Richard A. Soref, Newton Centre, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 1, 1977, Ser. No. 856,424
Int. Cl.² G02B 5/14
U.S. Cl. 350—96.16 **20 Claims**



1. A multi-mode propagation, light switching device comprising

a plate of electrooptically active material having first and second opposed major surfaces,

said plate having a focal surface substantially perpendicular to said opposed major surfaces,

said plate additionally having a cylindric surface opposite said focal surface,

reflector means opposite said focal surface at said cylindric surface,

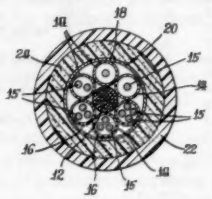
at least one multi-mode light guide in abutting relation with said focal surface for illuminating a major portion of said reflector means, and

first and second opposed electrode patterns for placing a selectable electric field between portions of said opposed major surfaces whereby said light illuminating said reflector means is directed at a first location on said focal surface for a first intensity of said electric field and at least partly in a second location thereon for a second intensity of said electric field.

4,143,942
FIBER OPTIC CABLE AND METHOD OF MAKING SAME

Gene S. Anderson, Batavia, Ill., assignor to Belden Corporation, Geneva, Ill.

Filed Oct. 26, 1976, Ser. No. 735,403
Int. Cl.² G02B 5/16
U.S. Cl. 350—96.23 **12 Claims**

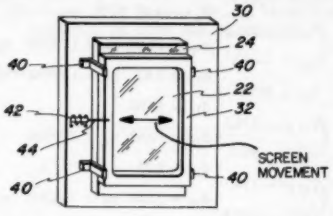


1. A fiber optic cable consisting of a flexible non-metallic elongate strength member extending the length of the cable, at least one fiber optic bundle comprising at least one fiber optic element having a non-metallic loose fitting tubular protective sheath substantially coaxial along the length of said fiber optic element, said protective sheath being flexible but sufficiently rigid to provide substantial crush resistance, a plurality of elongate non-metallic filler members of substantially similar transverse cross-sectional configuration and size as said fiber optic bundle, said fiber optic bundle and a sufficient number of filler members being helically cabled along said elongate strength member so that, when considered in a transverse cross section of said cable, said fiber optic bundle and filler members fully circumferentially encircle said strength member with said fiber optic bundle and filler members contacting said strength member and each next adjacent fiber optic bundle or filler member along lines of contact extending longitudinally thereof, said elongate strength member having greater tensile strength and lower elongation per unit length than said fiber optic elements, a non-metallic tape wrapped coaxially over said fiber optic bundle and said filler members and elongate strength member to secure said fiber optic bundle, filler members and elongate strength member in generally fixed but flexible relation and establish a cable core, and a non-metallic flexible protective jacket coaxially over said cable core, said tape providing a heat barrier for said fiber optic elements and maintaining said fiber optic bundle, filler members and elongate strength member in assembled relation to facilitate stripping of said jacket without disturbing said fiber optic elements.

4,143,943
REAR PROJECTION SCREEN SYSTEM

Eric G. Rawson, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 17, 1977, Ser. No. 769,620
Int. Cl.² G03B 21/56
U.S. Cl. 350—120 **1 Claim**



1. A rear image projection system comprising:

first and second closely spaced, optically transparent plates, each of said plates having a light diffusing surface;

means for projecting an image upon said plates;

means for maintaining said first screen in a stationary position;

a plurality of flexible L-shaped spring straps for supporting said second screen; and

drive means coupled to said second screen for providing said second screen with only a linear motion relative to said first screen.

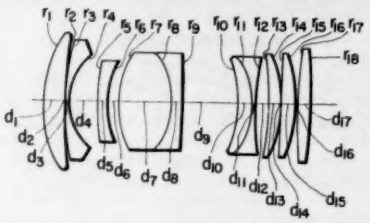
4,143,944
LARGE APERTURE WIDE-ANGLE PHOTOGRAPHIC LENS

Yasuo Takahashi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 30, 1977, Ser. No. 829,109
Claims priority, application Japan, Sep. 2, 1976, 51-105169
Int. Cl.² G02B 13/04
U.S. Cl. 350—214 **1 Claim**

1. A large aperture wide-angle photographic lens system, comprising in order from the object to the image side, a first positive lens L_1, second and third negative meniscus lenses L_2 and L_3 each of whose surfaces facing toward the image side has a higher curvature, a fourth positive lens L_4, a fifth negative lens L_5, said fourth and fifth lenses being adhered to each other at the surfaces of highest curvature, a sixth positive lens L_6 and seventh negative lens L_7, said sixth and seventh lenses

being adhered to each other at the surfaces of highest curva-



ture, and eighth, ninth and tenth positive lenses L_8, L_9 and L_{10}, said lens system satisfying the following conditions:

	F = 100				
L_1	$r_1 = 118.0$ $r_2 = 357.0$	$d_1 = 18.00$	$n_1 = 1.74320$	$\nu_1 = 49.4$	
		$d_2 = 0.86$			
L_2	$r_3 = 208.2$ $r_4 = 48.1$	$d_3 = 3.43$	$n_2 = 1.51633$	$\nu_2 = 64.1$	
		$d_4 = 25.14$			
L_3	$r_5 = 257.1$ $r_6 = 71.6$	$d_5 = 7.23$	$n_3 = 1.51633$	$\nu_3 = 64.1$	
		$d_6 = 11.43$			
L_4	$r_7 = 102.5$	$d_7 = 44.05$	$n_4 = 1.80610$	$\nu_4 = 40.9$	
L_5	$r_8 = -61.9$ $r_9 = -782.2$	$d_8 = 8.66$	$n_5 = 1.62588$	$\nu_5 = 35.7$	
		$d_9 = 19.71$			
L_6	$r_{10} = -110.2$	$d_{10} = 12.43$	$n_6 = 1.73400$	$\nu_6 = 51.5$	
L_7	$r_{11} = -68.2$ $r_{12} = 295.4$	$d_{11} = 3.43$	$n_7 = 1.80518$	$\nu_7 = 25.4$	
		$d_{12} = 10.00$			
L_8	$r_{13} = -334.3$ $r_{14} = -96.0$	$d_{13} = 12.43$	$n_8 = 1.73400$	$\nu_8 = 51.5$	
		$d_{14} = 0.29$			
L_9	$r_{15} = -714.7$ $r_{16} = -120.5$	$d_{15} = 11.43$	$n_9 = 1.71300$	$\nu_9 = 53.9$	
		$d_{16} = 2.86$			
L_{10}	$r_{17} = 442.1$ $r_{18} = -359.7$	$d_{17} = 11.09$	$n_{10} = 1.75700$	$\nu_{10} = 47.9$	
	$F_{1,2,3} = -F/0.84 = -119$				

where

F is the focal distance of the overall lens system, $F_{1,2,3}$ is the composite focal distance of the first through the third lenses.

d_j is the j-th spcing or lens thickness,

r_k is the radius of curvature of the k-th surface,

n_i is the refractive index of the d-line of the i-th lens, and

ν_i is the Abbe's number of the i-th lens.

4,143,945

SMALL RETRO-FOCUS WIDE ANGLE PHOTOGRAPHIC LENS SYSTEM

Toshifumi Kubota, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

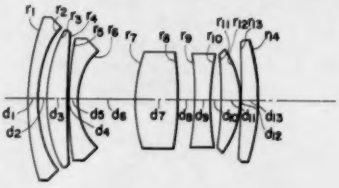
Filed Jul. 28, 1977, Ser. No. 819,726

Claims priority, application Japan, Jul. 29, 1976, 51/90572

Int. Cl.[2] G02B 9/64

U.S. Cl. 350—214 **3 Claims**

1. A retro-focus wide angle photographic lens system, comprising: a front lens group including a first negative meniscus lens having one surface greater in curvature than the other and oriented toward an image, a second positive lens, a fifth negative lens, and sixth and seventh positive lenses each having one surface greater in curvature than the other and oriented toward the image, the front lens group being spaced from the rear lens group, and the lens system satisfying the following conditions:



$$0.25F < d_6 < 0.38F, \tag{1}$$

$$\frac{F}{1.3} < |F_{1.2.3.}| < \frac{F}{0.7} \cdot F_{1.2.3} < 0, \tag{2}$$

$$\frac{F}{0.8} < F_{1.2.3.4} < \frac{F}{0.5}, \tag{3}$$

$$\frac{F}{1.15} < |F_{1.2.3.4.5}| < \frac{F}{0.65} \cdot F_{1.2.3.4.5} < 0, \tag{4}$$

$$F < \Sigma d < 1.5F, \text{ and} \tag{5}$$

$$0.25 < \frac{df}{db} < 0.5, \tag{6}$$

wherein:

F is the composite focal distance of the overall lens system;

$F_{1.2....i}$ is the composite focal distance of the first through the ith lenses;

dj is the lens thickness or lens distance of the ith lens;

Σd is the sum of all the lens thicknesses and lens distances;

df is the sum of the lens thicknesses and lens distances in the front group; and

db is the sum of the lens thicknesses and lens distances in the rear group;

said lens system further defined by:

F = 100mm, f = 1 : 2.8, ω = 37.5°

r_1	=	143.59	d_1	=	4.28	$n_1/\nu_1 = 1.49782/66.8$
r_2	=	68.16	d_2	=	4.98	
r_3	=	84.19	d_3	=	11.72	$n_2/\nu_2 = 1.69350/50.8$
r_4	=	774.17	d_4	=	0.35	
r_5	=	207.28	d_5	=	4.21	$n_3/\nu_3 = 1.60311/60.7$
r_6	=	33.88	d_6	=	30.00	
r_7	=	88.03	d_7	=	22.81	$n_4/\nu_4 = 1.80440/39.6$
r_8	=	−167.97	d_8	=	10.88	
r_9	=	−147.36	d_9	=	8.14	$n_5/\nu_5 = 1.80518/25.4$
r_{10}	=	104.93	d_{10}	=	5.16	
r_{11}	=	−278.94	d_{11}	=	10.81	$n_6/\nu_6 = 1.49700/81.3$
r_{12}	=	−47.19	d_{12}	=	0.35	
r_{13}	=	−529.61	d_{13}	=	8.74	$n_7/\nu_7 = 1.64000/60.2$
r_{14}	=	−97.85				

$f_B = 129.14$

$F_{1.2.3.} = -94.7$

$F_{1.2.3.4.} = 140.04$

$F_{1.2.3.4.5.} = -119.15$

where

r_k is the radius of curvature of the kth lens,

n_i is the d-line refractive index of the ith lens,

ν_i is the Abbe's number of the ith lens,

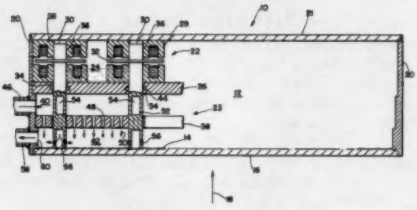
f_B is the back-focus, and

ω is the half picture angle.

4,143,946
IMPINGEMENT COOLED DEFORMABLE LASER MIRROR

Bruno S. Leo, Santa Monica, and Chang P. Liu, Rancho Palos Verdes, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 5, 1977, Ser. No. 857,723
Int. Cl.² G02B 5/08
U.S. Cl. 350—310 **8 Claims**



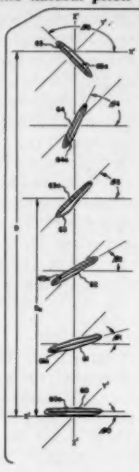
1. An impingement cooled deformable laser mirror comprising:
- a face plate having first and second faces;
- an optically reflective surface formed on said first face;
- said face plate being capable of being deformed to secure optimum beam reflection of a beam of light;
- a control housing attached to said face plate contiguous to said second face;
- means positioned in said housing for controlling face plate geometry;
- means providing inlet and outlet chambers for conducting coolant into and out of said housing;
- a nozzle plate supported in said housing, said nozzle plate having a uniform array of fluid nozzles distributed therein, for providing impinging fluid jets of coolant normal to said second face;
- whereby undesirable thermal distortions in face plate geometry caused by the reflection of said light beam are substantially precluded.

4,143,947
METHOD FOR IMPROVING THE RESPONSE TIME OF A DISPLAY DEVICE UTILIZING A TWISTED NEMATIC LIQUID CRYSTAL COMPOSITION

Siegfried Aftergut, Schenectady, and Herbert S. Cole, Jr., Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 697,982, Jun. 21, 1976, abandoned.
This application Feb. 21, 1978, Ser. No. 879,367
Int. Cl.² G02F 1/13
U.S. Cl. 350—334 **6 Claims**

1. A method for improving the spontaneous decay time of a nematic liquid crystal display device having a display cell containing a pair of substrates, comprising the steps of:
- spacing the facing interior surfaces of said pair of substrates a selected separation distance apart;
- filling the volume defined between the separated facing interior surfaces of said substrates with a quantity of a nematic liquid crystal composition having only a net positive dielectric anisotropy; and
- dissolving a preselected amount of an optically-active additive, selected from the group consisting of (−)-methylcyclopentane and d-carvone, in said liquid crystal composition to render the natural pitch thereof larger than the

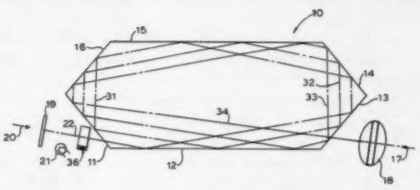


separation distance but smaller than four times that distance.

4,143,948
LIGHT BEAM POSITION CONTROL SYSTEM

Joseph T. McNaney, 8548 Boulder Dr., La Mesa, Calif. 92041

Filed Sep. 26, 1977, Ser. No. 836,301
Int. Cl.² G02F 1/33
U.S. Cl. 350—358 **2 Claims**



1. In a message character display system:
- (a) a primary source of light;
- (b) light mask means for providing an array of message characters and means for exposing message characters of said array, selectively, to light from said primary source for providing any one of a plurality of individual message character shaped sources of light;
- (c) a message character display medium;
- (d) said array of message characters and said display medium positioned, respectively, at first and second ends of message character shaped light beam optical paths of said system;
- (e) optical means positioned along an optical axis of said system intermediate said array of message characters and said display medium for projecting an image of a message character selectively exposed to light from said primary source toward a predetermined character display position at said display medium, said display position representative of a reference position at said display medium;
- (f) acousto-optic light deflector means including an interaction medium and acoustic wave generator means for establishing any of a number of different acoustic wave light deflecting conditions within said medium thereof, said interaction medium positioned intermediate said array of message characters and said optical means positioned along said optical axis;

(g) means for exposing a predetermined one of said message characters of said array to light from said primary source and establishing, simultaneously, a predetermined one of said light deflecting conditions within said interaction medium for allowing said display medium to be exposed to a light image of said predetermined one of said message characters through said optical means and coincident with said reference position at said display medium;

(h) means for exposing another predetermined one of said message characters to light from said primary source and establishing, simultaneously, another predetermined one of said light deflecting conditions within said interaction medium for allowing said display medium to be exposed to a light image of said other predetermined one of said message characters through said optical means and coincident with said reference position at said display medium.

4,143,949

PROCESS FOR PUTTING A HYDROPHILIC COATING ON A HYDROPHOBIC CONTACT LENS

Richard Y. Chen, Webster, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Oct. 28, 1976, Ser. No. 736,612

Int. Cl.² G02C *7/04*

U.S. Cl. 351—160 H **4 Claims**

1. An electrodeless glow discharge polymerization and coating process for making a hydrophobic contact lens into a hydrophilic contact lens consisting essentially of:

(1) providing a hydrophobic, optically transparent, oxygen permeable contact lens,

(2) placing the hydrophobic contact lens into a glow discharge apparatus containing an atmosphere comprising a polymerizable organic monomer consisting essentially of hydroxyalkylmethacrylates, hydroxyalkylacrylates, glycidylmethacrylate, propylene oxide and N-vinyl-2-pyrrolidone; and

(3) subjecting the monomer to electromagnetic radiation sufficient to produce an electrodeless glow discharge at a pressure of about 100 to about 700 millitorr to cause the polymerizable organic monomer to polymerize and to form hydrohilic polymeric integrally bonded uniform coating from about 50A to about 20,000A thick on the hydrophobic contact lens thereby forming a hydrophilic, optically transparent, oxygen permeable contact lens.

4,143,950

CAMERA

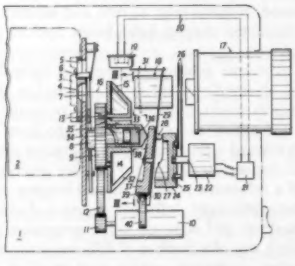
Josef Schild, Vienna, Austria, assignor to Ing. Karl Vockenhuber and DDr. Raimund Hauser, both of Vienna, Austria

Filed May 30, 1978, Ser. No. 910,651

Claims priority, application Austria, Jun. 6, 1977, 3977/77

Int. Cl.² G03B *21/36*

U.S. Cl. 352—91 C **6 Claims**



1. Camera, particularly a motion picture camera with an objective, defining a light path aligned with respective pictures of a film, comprising

two exposure control devices comprising a diaphragm and a shutter operatively disposed in the light path,

a common adjustment drive means for adjusting said diaphragm and said shutter according to a predetermined program for variation of the light quantity falling on each picture of the film,

an additional override adjustment means for adjustment of at least one of said two exposure control devices independently of the predetermined program.

4,143,951

CINE-PROJECTOR

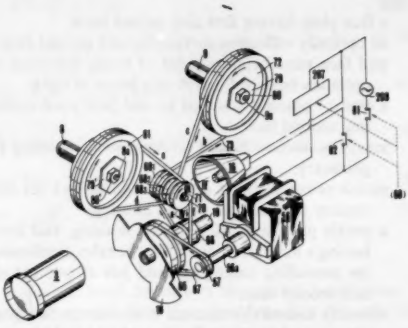
Kuniyoshi Suzaki, Tokyo; Akira Ashida, Yokohama; Takashi Itani, Yokohama; Tateo Yamada, Yokohama; Masaya Maeda, Kawasaki; Kiyoshi Takahashi, Kunitachi, and Hiroyuki Takimoto, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 21, 1976, Ser. No. 752,998

Claims priority, application Japan, Dec. 27, 1975, 50-156674; Dec. 27, 1975, 50-156675; Dec. 27, 1975, 50-156676; Jan. 16, 1976, 51-3884

Int. Cl.² G03B *21/38*

U.S. Cl. 352—169 **17 Claims**



1. A drive control mechanism for selectively actuating reel spindle means of a motion picture projector, comprising:

shiftable means manually shiftable between a plurality of positions and having a U-shaped portion;

pulley means rotatably supported by said reel spindle means;

drive means for rotating said pulley means including a motor operatively coupled with said pulley means; and

clutch means including connecting means provided on said reel spindle means capable of selectively operatively coupling said pulley means with said reel spindle means to make them rotatable together, and control means for controlling said connecting means to be in a first state in which said pulley means is coupled with said reel spindle means and to be in a second state in which the pulley means and said reel spindle means are not coupled with each other, said control means having

cam means forming a first cam face and a second cam face, and

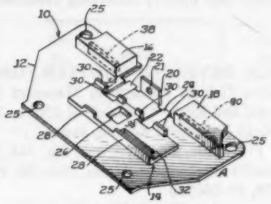
a control part consisting of cam follower means engaged with said cam means and control lever means operatively coupled with said shiftable means at the U-shaped portion thereof, the cam follower means and the control lever means being arranged in one unified body;

said control means being arranged to rotate in response to shifting of the shiftable means between said positions, and being operatively connected to said connecting means to hold said connecting means in said second state when said cam follower of the control means is in a position corresponding to said first cam face and to hold it in said first state when said cam follower is in a position corresponding to said second cam face.

4,143,952
APERTURE ASSEMBLY

Yukio Katahira, Sayama, and Toshiaki Morimoto, Kokubunji, both of Japan, assignors to Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.), Higashimurayama, Japan

Filed Jun. 13, 1977, Ser. No. 806,389
Claims priority, application Japan, Jun. 19, 1976, 51/080527[U]
Int. Cl.² G03B 1/48
U.S. Cl. 352—221 7 Claims



1. In a motion picture camera for transporting cartridge-contained film past an aperture by means of a shuttle having a film advancement claw for advancing the film and a pair of shuttle feet, a thin aperture assembly for holding the film in alignment with the aperture and for holding the shuttle in alignment with the film, comprising:

a thin metal base plate having top and bottom sides, an exposure window, a slit elongated in the direction of film feed for receiving a shuttle claw from the bottom side of said base plate, and a pair of elongated openings spaced apart in the direction of film feed;

a thin, molded aperture piece fixedly mounted on the top side of said base plate and having an exposure window and a shuttle claw slit aligned, respectively, with the exposure window and slit of said base plate;

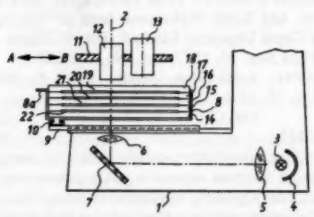
a pair of cartridge alignment shoulders fixedly disposed on the top side of said base plate, each shoulder situated over one of the elongated openings in said base plate and having an internal, downwardly opening, elongated groove aligned with one of the elongated openings in said base plate for receiving a shuttle foot extending from the bottom side of said base plate;

whereby a thin yet strong aperture assembly is provided for maintaining alignment among the film, the exposure window and the shuttle.

4,143,953
MICROFILM READER

Walter Rauffer, Munich, Fed. Rep. of Germany, assignor to Agfa-Gevaert AG., Leverkusen, Fed. Rep. of Germany

Filed Sep. 19, 1977, Ser. No. 834,495
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1976, 2643287
Int. Cl.² G03B 21/11
U.S. Cl. 353—27 R 8 Claims



1. A microfilm reader comprising:

a light source emitting a light path and operatively mounted in the reader,

projection objective means operatively mounted in the reader transversely relative to said light path;

at least five parallel, transparent, laterally invertible support plates mounted transversely relative to the light path between said light source and said projection objective means and adapted to support four microfiches insertable between the plates for reproduction of the microfiches; a first number of the microfiches positioned closest to the obejctive means being optically optimally positioned for focusing; and

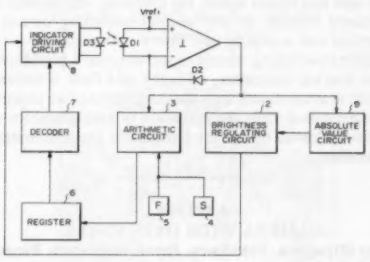
means for slidably supporting said support plates in one of two preselected positions which are 180° degrees spaced from each other, said support means being slidable in at least two directions normal to the light path and adapted to releasably engage the support plates; the two microfiches located closest to the objective means being in the proper reproduction position;

said projection objective means being adjustable for properly selectively focusing on at least two planes of these microfiches located relatively closest to the objective means.

4,143,954
LIGHT EMITTING INDICATOR FOR A CAMERA

Saburo Numata, and Shinichiro Okazaki, both of Urawa, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Feb. 23, 1977, Ser. No. 771,349
Claims priority, application Japan, Feb. 23, 1976, 51-18611
Int. Cl.² G03B 7/08
U.S. Cl. 354—23 D 6 Claims

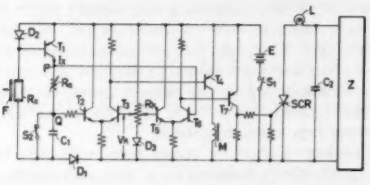


1. In a camera comprising a view finder, a photocell positioned in the optical path of the view finder, light emitting indicator means visible in the view finder for displaying exposure information, and circuit means connected to the photocell to receive therefrom an electrical signal according to light reaching the photocell and connected to the light emitting indicator means to control the operation thereof in accordance with the electrical signal, a control system in which: the indicator means is located relative to the photocell to permit light from the indicator means to shine on the photocell, and the circuit means comprises means to cause the brightness of the light emitting indicator means to decrease with decreasing scene brightness down to a predetermined level of scene brightness and to increase in response to further decrease of scene brightness below said predetermined level to compensate for the undesired decrease of the amount of light from the scene to the photocell, thereby precluding the setting of an exposure longer than approximately the exposure corresponding to said predetermined level of scene brightness.

4,143,955
FLASH SYNCHRONIZATION CONTROLLING MEANS FOR PROGRAM TYPE ELECTRIC SHUTTERS

Kunio Matsumoto, Ageo, Japan, assignor to Copal Company Limited, Tokyo, Japan

Continuation of Ser. No. 567,840, Apr. 14, 1975, abandoned. This application May 19, 1977, Ser. No. 798,688
Claims priority, application Japan, Apr. 15, 1974, 49-42618
Int. Cl.[2] G03B 7/08, 15/05
U.S. Cl. 354—34 16 Claims



1. A flash synchronization control system for program type electric shutters comprising:

at least one set of shutter blades;

governor means for upon actuation releasably opening said shutter blades at a low speed;

electromagnetic means, responsive to control signals applied thereto, for controllably effecting release of said shutter blades by said governor means to rapidly close said shutter blades;

a first switching circuit, responsive to application of a first predetermined voltage to an input terminal, for generating said control signal to said electromagnetic means to effect said release of said shutter blades by said governor means;

a second switching circuit, responsive to application of a second predetermined voltage, to an output terminal for generating an activation signal to said flash;

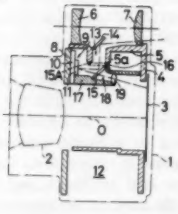
means for generating a signal indicative of the brightness of the object to be photographed; and

means, responsive to the actuation of said governor means and said brightness signal, for applying said second predetermined voltage to said second switching circuit input terminal and applying said first predetermined voltage to said first switching circuit input terminal a predetermined time interval thereafter, whereby said flash is activated at a time in accordance with the brightness of an object to be photographed after the actuation of said governor means and said shutter blades are closed said predetermined time thereafter.

4,143,956
CAMERA WITH DATE ENTRY

Fumihiro Miyagawa, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Feb. 18, 1977, Ser. No. 769,882
Claims priority, application Japan, Feb. 26, 1976, 51-20260; Mar. 9, 1976, 51-25292; Mar. 9, 1976, 51-25293; Mar. 9, 1976, 51-25294
Int. Cl.[2] G03B 17/24
U.S. Cl. 354—106 10 Claims

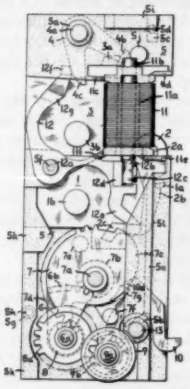


3. A date entry device for a camera comprising a digital watch type date indicator in the camera having a luminescent date display for displaying the calendar date, and optical means associated said luminescent date display for passing the light of said luminescent date display from said luminescent date display to a film in the camera, a sight window for permitting a viewing of said luminescent date display from outside said camera, a light shield for preventing incident light on said sight window from reaching the film when a picture is being taken, and a date adjusting means for adjusting the luminescent date display of said date indicator, the camera including a battery receiving chamber with a closing lid, said adjusting means disposed within said battery receiving chamber.

4,143,957
CONTROL DEVICE OF SHUTTER FOR CAMERA

Ichiro Nemoto; Tadashi Nakagawa; Masanori Watanabe; Mitsuo Koyama, and Eiichi Onda, all of Chiba, Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed Nov. 24, 1976, Ser. No. 744,759
Claims priority, application Japan, Nov. 25, 1975, 50-140959; Nov. 25, 1975, 50-140960
Int. Cl.[2] G03B 9/08, 9/62
U.S. Cl. 354—266 10 Claims



1. In a camera shutter of the type having a pair of spaced apart base plates for supporting the shutter components; the improvement comprising at least one of said base plates being composed entirely of synthetic resin material and having a set of tubular portions extending toward and connected to the other of said base plates thereby connecting said base plates together and having a set of shafts turnably supporting thereon some of said shutter components, said tubular portions and said shafts being composed of synthetic resin material and comprising one integral body with said one base plate.

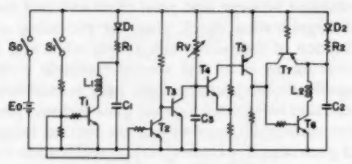
4,143,958
CONTROLLING CIRCUIT FOR ELECTRIC SHUTTERS

Yasuo Ishiguro, and Kenji Wakazono, both of Tokyo, Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Sep. 30, 1977, Ser. No. 838,225
Claims priority, application Japan, Oct. 8, 1976, 51-134868[U]; Dec. 27, 1976, 51-159907
Int. Cl.[2] G03B 17/40
U.S. Cl. 354—267 8 Claims

1. A controlling circuit for electric shutters comprising a current source, a current source switch connected to said current source, an exposing operation starting switch connected to said current source, a first driving coil connected to said exposing operation starting switch and capable of being energized to start a shutter opening motion when said current source switch and exposing operation starting switch are closed, an exposure time controlling circuit connected to said

current source through said current source switch and capable of starting its operation simultaneously with opening the shutter and capable of issuing an electric signal when a proper exposure time elapses, switching means connected to said exposure time controlling circuit and capable of being made conductive by the issuance of said electric signal from said exposure time controlling circuit, a second driving coil connected to said switching means and capable of starting a shutter closing motion when energized by the conduction of said switching means, a first capacitor connected between said



second driving coil and switching means and capable of being charged by said current source when said current source switch is closed and capable of flowing a discharge current to said second driving coil when said switching means are made conductive, and a voltage drop detecting circuit connected between said first capacitor and said second driving coil, and said switching means, said switching means being made conductive through said voltage drop detecting circuit when said current source switch is opened before said exposure time controlling circuit issues said electric signal or when the voltage of said current source is lower than a predetermined value.

4,143,959

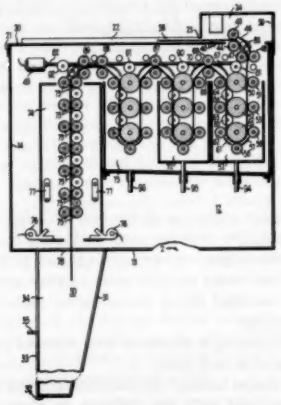
COMPACT X-RAY FILM PROCESSOR

Warren G. Fischer, 4N003 Wildrose Rd., St. Charles, Ill. 60174

Filed Dec. 3, 1976, Ser. No. 747,342

Int. Cl.[2] G03D *3/08*

U.S. Cl. 354—316 **8 Claims**



1. In a film processor including:

(a) a plurality of containers for holding film processing fluids;

(b) drying means for removing liquids from processed films;

(c) motive means for moving and guiding a piece of film along a path passing through each of said plurality of containers and, subsequently, through said drying means, said motive means including a roller transport system with moving rollers, said rollers being the only moving components of said motive means contacted by said film;

(d) structural means coupled to said containers, said drying means, and said motive means, for maintaining a predetermined spatial relationship between said containers and said drying and said motive means;

(e) a receptacle coupled to said structural means and occupying a space below and substantially within the horizontal area of said containers and said drying means, said motive means, after moving a piece of film through said containers and said drying means, placing said piece of film in said receptacle and moving said piece of film no further; and

(f) an enclosure with at least two of said containers located inside said enclosure,

the improvement wherein (1) said motive means moves said film in a first direction at a first point on said path and in a second direction at a second point on said path, said first and second directions having respectively first and second horizontal components of motion differing by substantially 180°, (2) said enclosure has a first opening located therein near the top of said processor, said motive means initially moves film in said first direction along a first part of said path, with the beginning of said first part of said path being located near said first opening, the line of travel through said first opening in traveling from the inside to the outside of said enclosure being oriented in said second direction generally opposed to said first direction, said enclosure has a second opening along said path leading into said receptacle, said motive means deposits film into said receptacle along a second part of said path, said receptacle has a third opening therein, the line of travel through said third opening in traveling from the inside to the outside of said receptacle being said third direction generally parallel to said second direction and generally opposite to said first direction of said first part of said path and, (3) said processor has a side generally facing said second direction, whereby film may be fed into and removed from said processor with access only to said processor's top and said side.

4,143,960

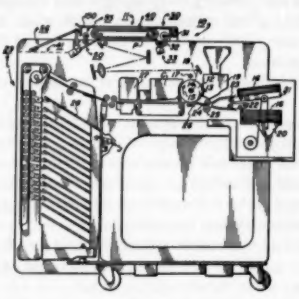
RETRACTABLE SUPPORT MEMBER

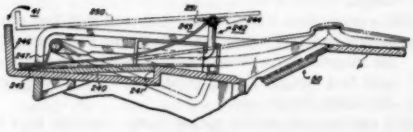
Michael J. Tracy, Hilton, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 6, 1977, Ser. No. 830,723

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—3 R **9 Claims**





1. In a reproducing apparatus including an illuminating station and means for forming an image on a sheet of support material of an object positioned at said illuminating station, said illuminating station including a transparent viewing platen

having a registration edge against which said object is placed for imaging, a catch tray arranged adjacent said registration edge of said platen, a retractable support member arranged adjacent said registration edge of said platen and above said catch tray, document decelerating means supported by said retractable support member, means for supporting said support member in a first position above the level of said platen whereby said document decelerating means is positioned for decelerating documents as they may be advanced into said catch tray and for retracting said support member to a second position downwardly of said first position in response to the urging of an object placed on said viewing platen.

4,143,961

ELECTROPHOTOGRAPHIC DUPLICATION APPARATUS

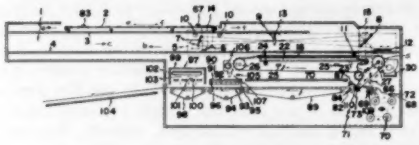
Hiroo Nakamoto, 12-go, 9-ban, 3-chome, Wakazono, Kokura-Minami-ku, Kitakyushu-shi, Fukuoka-ken, Japan

Continuation-in-part of Ser. No. 566,564, Apr. 9, 1975, abandoned. This application Jan. 18, 1977, Ser. No. 760,479

Claims priority, application Japan, Apr. 15, 1974, 49/42527; Apr. 16, 1974, 49/42461; May 18, 1974, 49/56667[U]

Int. Cl.[2] G03G *15/04*

U.S. Cl. 355—5 **6 Claims**



1. In a compact electrophotographic duplication apparatus comprising:

(a) a housing body;

(b) a unit on said body for receiving an original document to be copied in a horizontal plane, said unit comprising a transparent contact glass on which said original document is directly placed and a print chart containing indicia;

(c) first drive means for slidably moving said unit back and forth in said housing body along a first straight line path;

(d) a focusing-and-magnification check glass mounted on said housing body in view of the operator of the duplicating apparatus;

(e) means defining a photosensitive surface in said housing body;

(f) an image transmission system in said housing body operable to project a first image of said original document and said print chart and form a second image of said original document and said print chart, said second image being of a size equal to or different from said first image, said image transmission system comprising:

(i) a first mirror means underlying said unit for reflecting a first image of said print chart and said original document,

(ii) a second mirror means for receiving the last said reflected image from said first mirror means as a second image,

(iii) a projection lens disposed between said first mirror means and said second mirror means for determining the magnification ratio of said second image relative to said first image of said print chart and said original document image, and

(iv) said second mirror means being rotatable to a first rotatable position to transmit said print chart image onto said focusing-and-magnification check glass through said first mirror means, said projection lens, and said second mirror means and to a second rotatable position to transmit the reflected original document image onto said photosensitive surface through said first mirror means, said projection lens and second mirror means; and

(g) second drive means for slidably moving said image transmission system on said housing body along a second straight line path, said second straight line path being parallel to said first straight line path such that scanning of the original document is effected by said image transmission system as relative movement is effected between said unit and said image transmission system,

whereby when said second mirror means is in said first rotatable position, a magnification-focusing light path is established between said print chart and said focusing-and-magnification check glass for providing a visual indication of the second image, and when said second mirror means is in said second rotatable position, a magnification-duplication light path is established between said transparent contact glass and said photosensitive surface for transmitting the second image onto said photosensitive element, said mangification-focusing light path having the same optical light path length as said magnification-duplication light path and said photosensitive surface being maintained stationary during said transmission of said second image onto said photosensitive surface.

4,143,962

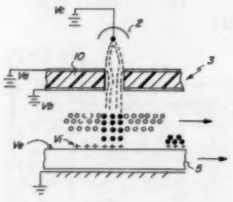
ELECTROGRAPHIC IMAGING APPARATUS AND METHOD

Clark N. Kurtz, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 9, 1977, Ser. No. 805,216

Int. Cl.[2] G03G *15/10*

U.S. Cl. 355—10 **11 Claims**



1. In electrographic apparatus of the type utilizing an electrostatic-charge-retentive member and including means for forming an electrostatic pattern having image and background portions of different charge level on such member and means for moving such member along an operative path, the improvement comprising:

(a) means for producing a stream of ions directed generally transversely across said path;

(b) ion control means located intermediate said ion producing means and said path and defining an elongated slit means transverse to said path, in alignment with said ion stream and spaced generally uniformly from said path;

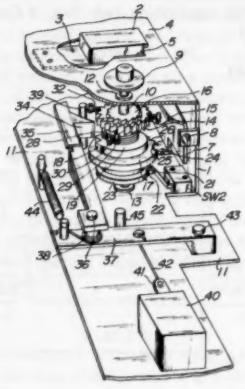
(c) means for electrically biasing at least a portion of said control means facing said path to a potential level intermediate the image and background charge portions of such pattern; and

(d) means for directing substantially neutrally-charged mist particles through the space between said control means and said path whereby the passage of ions through said slit is modulated according to said charge pattern and said mist particles are thereby charged and attracted to said member in accordance with said pattern.

4,143,963
DEVICE FOR CONTROLLING ROTATIONS OF PHOTOSENSITIVE DRUM FOR ELECTROGRAPHIC APPARATUS

Takashi Matsuyama, Hachioji; Hiroshi Tsuda, Mitaka, and Muneo Kasuga, Hachioji, all of Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Filed Aug. 30, 1977, Ser. No. 829,090
Int. Cl.[2] G03G *21/00*
U.S. Cl. 355—14 **4 Claims**



1. A device for controlling rotations of a photosensitive drum for electrographic apparatus, comprising means for setting number of copies to be reproduced to any desired number and composed of a dial; means for subtracting the rotated number of a photosensitive drum from the number of copies set beforehand by said dial and composed of a first ratchet wheel secured to a shaft of the dial, a claw engageable with a tooth of said first ratchet wheel and rotating said first ratchet wheel in a direction opposed to the rotating direction of said dial, and means including a solenoid and receiving a signal from a detection means, for detecting the number of turns of the photosensitive drum and operating said claw; means for rotating the photosensitive drum for two turns and then stopping it when the number of copies set beforehand becomes 1 and comprised of a second ratchet wheel freely engageable with said dial shaft and arranged in opposition to the first ratchet wheel, the said second ratchet wheel having two teeth and being urged against said first ratchet wheel so as to make the two teeth of said second ratchet wheel continuous with the teeth of said first ratchet wheel, said second ratchet wheel including first and second cams, said first cam being engaged with a pawl interlocked with a start switch and said second cam being engaged with a stop switch, whereby the rotation of said photosensitive drum causes a claw to engage with the first ratchet wheel when the dial is set to 2 or larger than 2 and causes said claw to engage with the second ratchet wheel when said dial is set to 1 so as to return said first and second cams to their original positions, thereby setting said stop switch to OFF position and stopping said photosensitive drum.

4,143,964
SCANNING LIGHT SOURCE

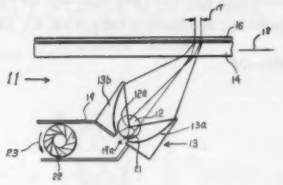
Yukio Ogura, and Hisao Ishii, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 7, 1977, Ser. No. 775,026
Claims priority, application Japan, Mar. 9, 1976, 51-27736[U]
Int. Cl.[2] G03B *27/52*
U.S. Cl. 355—30 **9 Claims**

1. A light source for radiating a narrow elongated beam of light onto a document carrier which is movable perpendicular to the beam, comprising in combination:

an elongated lamp;

an elongated reflector operatively disposed parallel to and behind the lamp for reflecting light therefrom onto the document carrier thereby forming the beam, the reflector being formed with orifice means through a rear portion thereof;



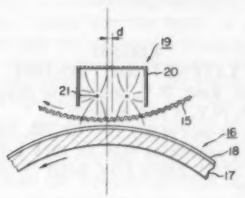
a blower disposed behind the reflector for causing air to flow through the orifice means and around the lamp; and

a duct communicating with the orifice means, the blower being disposed in the duct.

4,143,965
ELECTROPHOTOGRAPHY METHOD UTILIZING A PHOTOCONDUCTIVE SCREEN

Yujiro Ando, Yokohama; Shunichi Ishihara, Kodaira; Shuji Murakawa, Yokohama, and Katsunobu Ohara, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 568,465, Apr. 16, 1975, abandoned.
This application Aug. 17, 1977, Ser. No. 825,481
Int. Cl.[2] G03G *15/18*
U.S. Cl. 355—35 C **14 Claims**



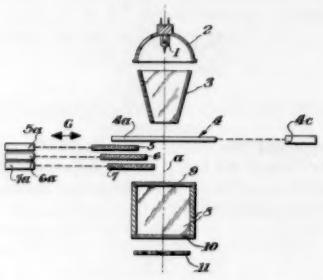
1. In an electrophotographic method in which a photosensitive screen having a multitude of tiny openings is used to form a primary electrostatic latent image thereon and an ion flow from a fixed corona discharger is modulated by the primary electrostatic latent image to form a secondary latent image on a chargeable member, wherein the width of the corona discharge impinging on the surface of the screen defines a modulation width and wherein the distance between a point on the screen and the chargeable member varies as the point is moved through the modulation width, comprising the steps of moving the screen past the fixed corona discharger so that a point on the screen moves from one end of the modulation width to the other end thereof and simultaneously moving the chargeable member relative to the fixed corona discharger, the improvement comprising the step of:

establishing an acceleration field having a voltage Ve between the screen and the chargeable member which satisfies the relation $Ve/d > 500$ (V/mm) at the one end of the modulation width, where d is the distance between the screen and the chargeable member and which also satisfies the relation $(Ve-Vs)/d > 500$ (V/mm) at the other end of the modulation width, where Vs is the maximum potential of the secondary electrostatic latent image formed on said chargeable member.

4,143,966
ILLUMINATION DEVICE FOR PHOTOGRAPHIC COLOR APPARATUS

Mario Gandini, Brixen, Italy, assignor to Durst AG Fabrik Fototechnischer Apparate, Bozen, Italy

Filed Jan. 30, 1978, Ser. No. 873,554
Claims priority, application Italy, Feb. 17, 1977, 4811 A/77
Int. Cl.[2] G03B 27/76
U.S. Cl. 355—35 15 Claims

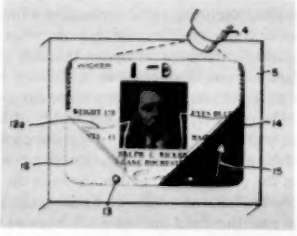


1. An illuminating device for a photographic color printing apparatus having color filters insertable at variable amounts into a beam of printing light to adjust its color content comprising a source of the beam of printing light, a variable aperture diaphragm disposed adjacent the color filters in the path of the printing beam for controlling the intensity of light emerging from the device, a light-conducting shaft disposed between the source and the diaphragm, and the cross sections of the light-conducting shaft and the diaphragm aperture being coordinated with each other to maintain a substantially uniform color content in the printing light beam over the entire range of variation of the diaphragm aperture.

4,143,967
LATENT PHOTO SYSTEM

Ralph C. Wicker, Rush, N.Y., assignor to Benjamin J. Haggquist, Fairport, N.Y., a part interest

Continuation-in-part of Ser. No. 710,300, Jul. 30, 1976, abandoned. This application May 30, 1978, Ser. No. 910,639
Int. Cl.[2] G03B 27/32; B41M 1/14; B42D 15/00; G03B 27/68
U.S. Cl. 355—77 18 Claims



15. A method of producing on a substrate a latent image of an object which appears to be invisible to the unaided eye, comprising

photographing the object through a halftone screen to produce at least one halftone image of the object,

placing said halftone image in registry with a strip of light sensitive film and a dark screen having therein a plurality of extremely small apertures arranged in parallel rows oriented in predetermined angular offset relation to the rows of halftone dots forming said halftone image,

exposing said strip of film to said halftone image through the small openings in said screen,

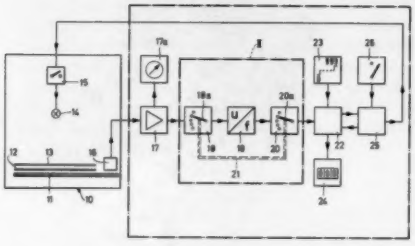
developing the exposed film to produce thereon the latent image of said object, and

imprinting said latent image on said substrate.

4,143,968
CONTROL DEVICE AND COPIER

Georg Sader, Bechtheim, and Walter Pils, Bremthal, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 23, 1976, Ser. No. 699,086
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1975, 25286593
Int. Cl.[2] G03B 27/78
U.S. Cl. 355—83 7 Claims

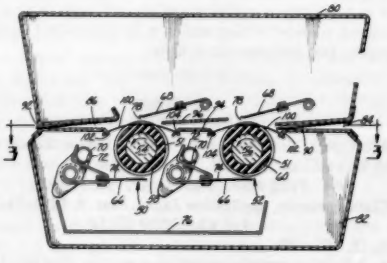


1. A control device, suitable for use to control the exposure of a light-sensitive material in a copying apparatus for the preparation of a printing plate, which comprises program store means for predetermining a basic exposure, input line means for connection to a photocell for measuring the luminous intensity of a light source in the copying apparatus, comparator means having its input connected to an output of the program store means and connected by a transmission path means to the input line means, the output of the comparator means being connectable to a control switch for the light source controlling the exposure of the light-sensitive material imagewise exposed by the light source, and the transmission characteristics of the path being variable in steps by switching means provided in the transmission path means, adjacent steps of which switching means have transmissivities in the ratio $\sqrt{2}:1$.

4,143,969
SHEET GUIDE APPARATUS FOR DIAZO COPYING MACHINES

Eugene P. Oddo, Mt. Prospect, Ill., assignor to Addressograph-Multigraph Corporation, Los Angeles, Calif.

Filed Sep. 29, 1877, Ser. No. 837,743
Int. Cl.[2] G03B 27/30; G03D 5/06
U.S. Cl. 355—100 4 Claims



1. In an apparatus for developing a diazotype copy sheet including a developer unit having a supply of developer liquid, a chamber having an ingress and an egress for passage of a

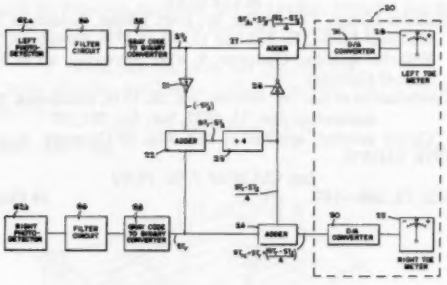
copy sheet through the chamber for development, a first and a second roller rotatably mounted in the chamber in tandem axially spaced apart parallel relation, each said roller having a surface adapted to carry a quantity of developer liquid, means for applying a metered amount of developer liquid from the supply to the surface of each said first and second rollers, and drive means for rotating the first and second rollers, the improvement comprising:

guide means comprising a first and a second set of guide wires to prevent wrapping of the copy sheet about the rollers as the copy sheet is transported sequentially over and in contact with an upper peripheral surface of each of the first and second rollers, said first set of guide wires being strung taut above and transverse to the first roller in spaced apart parallel relation with a portion of each said guide wire of the first set of guide wires extending over and in contact with the first roller with said portion disposed below the upper peripheral surface thereof, and said second set of guide wires being strung taut above and transverse to the second roller in spaced apart parallel relation and offset axially from the first set of guide wires with a portion of each said guide wire of the second set of guide wires extending over and in contact with the second roller with said portion disposed below the upper peripheral surface thereof.

4,143,970
WHEEL ALIGNMENT METHOD AND APPARATUS

Melvin H. Lill, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Sep. 16, 1977, Ser. No. 833,638
Int. Cl.[2] G01B 11/26
U.S. Cl. 356—155 **11 Claims**

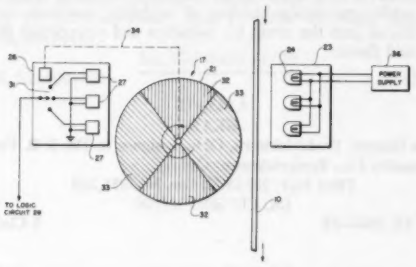


1. An improved wheel alignment system including means removably mounted to each of the front wheels of a motor vehicle for projecting a beam of light from said wheel, each of said beams being projected generally toward the opposing wheel along a path which is generally normal to the plane of the wheel from which said beam is projected, means mounted to each of said wheels for detecting the position of the beam projected from the opposing wheel, computing means operatively associated with said beam projecting and detecting means for providing individual wheel toe angle signals, and display means responsive to the signals from said computing means for indicating the toe angles of said front wheels, wherein the improvement comprises: further computing means responsive to said toe angle signals for generating a correction signal representative of a preselected percentage of the difference in magnitudes of said toe angle signals; and means responsive to said correction signal for modifying said toe angle signals to compensate for any errors in said toe angle signals resulting from the longitudinal displacement of the base reference plane of one of said detecting means from the base reference plane of the other of said detecting means due to rotation of the wheels about their steering axes.

4,143,971
RECONNAISSANCE/SURVEILLANCE SYSTEM UTILIZING COLOR SIGNATURE OF TARGET

Marilyn Levy, Little Silver, and Vincent W. Ball, Interlaken, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 22, 1977, Ser. No. 826,295
Int. Cl.[2] G01T 3/46
U.S. Cl. 356—404 **13 Claims**



1. Apparatus for detecting a target of known color signature and locating its position, which comprises:

film-supply means to continuously supply a color-sensitive photographic film;

a camera downstream of said film supply means to photograph onto said film successive portions of a scene suspected of containing said target;

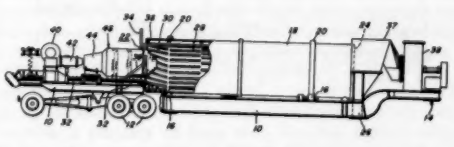
film processing means downstream of said camera to continuously process the exposed film using a rapid color processing technique;

examining means downstream of said film processing means, comprising light source means, a bank of photoreceptors, and analyzing means, with said film passing between the light source means and the bank of photoreceptors; wherein the light source means includes spectral selection means to supply light of at least two different spectral contents, the photoreceptors are connected to supply electrical output signals to the analyzing means, the analyzing means uses said output signals for successive regions of the film to form detected color signatures thereof comprising the ratio of the output signals therefrom for light of at least two different specified color components thereof, and the analyzing means further compares said detected color signatues with stored data for said known color signature and provides a given indication in response to finding a match within predetermined limits.

4,143,972
COMBUSTION CONTROL SYSTEM FOR BITUMINOUS DRUM MIXERS

Bernard A. Benson, Issaquah, Wash., assignor to Boeing Construction Equipment Company, Tukwila, Wash.

Filed Feb. 21, 1978, Ser. No. 879,407
Int. Cl.[2] B28C 5/46; B01F 9/00
U.S. Cl. 366—25 **10 Claims**



1. In a mixer for bituminous paving compositions of the type having a rotatable drum with a discharge end and an inlet end for the reception of aggregate and a bituminous binder, and

means located at said inlet end for directing heated gases into the interior of said drum to melt the bituminous binder; the improvement in said heating means which comprises:

(a) burner means for producing an open flame substantially aligned with the central axis of said drum;

(b) blower means for directing the open flame toward the interior of said drum; and

(c) a combustion chamber substantially completely surrounding said open flame, the combustion chamber having openings therein to permit heated gases of essentially uniform temperature to flow into the interior of said drum while preventing burning of asphaltic materials introduced into the drum by radiation and convection from said flame.

4,143,973

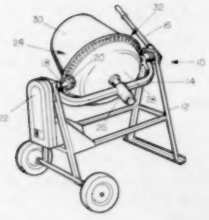
GEAR

Hans Hauser, Fredericktown, Ohio, assignor to The J. B. Foote Foundry Co., Fredericktown, Ohio

Filed Nov. 28, 1977, Ser. No. 855,368

Int. Cl.[2] B01F *11/00*

U.S. Cl. 366—54 **6 Claims**



2. A cement mixer comprising a mixing drum having a circumjacent metal flange extending outwardly around a middle portion of said drum, a plastic ring affixed to one side of said metal flange and extending around the entire periphery thereof, said plastic ring having a multiplicity of gear teeth extending away from said metal flange, said plastic ring comprising a plurality of segments, said segments having recesses at intermediate and end portions thereof, and fasteners extending through said flange and received in said recesses.

4,143,974

APPARATUS FOR PLASTICIZING GRANULAR SYNTHETIC PLASTIC MATERIALS

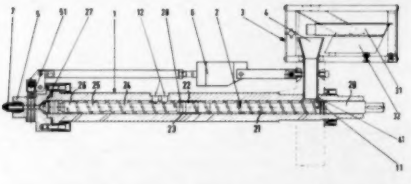
Herbert Strassheimer, Wehrheim, and Florian Übelacker, Altenstadt, both of Fed. Rep. of Germany, assignors to GKN Windsor GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 760,101, Jan. 17, 1977, abandoned. This application Feb. 9, 1978, Ser. No. 876,350

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1976, 2602204

Int. Cl.[2] B29B *1/06*

U.S. Cl. 366—78 **3 Claims**



1. Apparatus for the plasticizing and melting of synthetic plastic materials, particularly granular materials which, when plasticized, are introduced into the mold of an injection molding machine, comprising an elongated heatable cylinder having a constant inner diameter, an intake end provided with an inlet opening, a discharge end, and at least one gas-discharging aperture communicating with the surrounding atmosphere and disposed intermediate said opening and said discharge end; adjustable feeding means arranged to deliver metered quantities of granular material into said cylinder by way of said opening; and a feed screw rotatably mounted in said cylinder and including a material advancing section disposed in the region of said opening and having a first helical thread, a first material densifying section between said advancing section and said aperture, a pressure relaxing section disposed in the region of said aperture and having a second helical thread defining a groove of a depth exceeding the depth of the groove defined by said first thread by up to 20 percent, a second material densifying section between said pressure relaxing section and said discharge end, and a collar which is free of threads and is disposed between said first densifying section and said pressure relaxing section, said cylinder having an internal surface defining with said collar an annular shearing gap through which densified material passes from the cylinder portion surrounding said first densifying section into the cylinder portion surrounding said pressure relaxing section, said feed screw being cyclically movable axially of said cylinder between front and rear end positions through a distance which at most equals approximately 3D wherein D is the inner diameter of said cylinder and said aperture being provided in that portion of said cylinder which surrounds the rear third of said pressure relaxing section in the front end position of said feed screw, the axial length of said pressure relaxing section being between 1.6 and 2 times the extent of movement of said feed screw between said end positions thereof and between 5D and 6D.

4,143,975

APPARATUS FOR APPLYING ADHESIVE TO FIBROUS MATERIAL

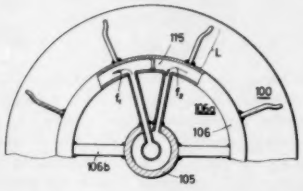
Wilhelm Lödige, Elsener Str. 9c; Fritz Lödige, Leuschner Str. 12; Josef Lücke, Im Lohfeld 13, all of 4790 Paderborn, and Wilhelm Schlüter, Osttorstr. 9, 4791 Schwaney, all of Fed. Rep. of Germany

Continuation of Ser. No. 600,066, Jul. 29, 1975, abandoned. This application Apr. 13, 1977, Ser. No. 787,157

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1974, 2437571

Int. Cl.[2] B01F *7/02, 15/02*

U.S. Cl. 366—147 **14 Claims**



1. An apparatus for applying adhesive to cellulose wood fibrous material circulating in a ring configuration comprising: a generally horizontally extending cylindrical member with an inlet at the top near one end and an outlet at the bottom near the other end, a shaft rotatably mounted on the axis of said cylindrical member and extending the length of said member, material engaging means carried by said shaft adjacent said inlet to rotate and advance said material in said cylindrical member, and mixing tool means secured to said shaft and spaced downstream from said material engaging means along the remainder of the shaft in circumferentially and axially distributed relation and extending substantially radially from said shaft toward the inner surface of said cylindrical member, said cylindrical member including an adhesive application zone and a mixing zone, said mixing tool means being in both

said zones, said mixing tool means in said adhesive application zone including tool means each having a radially inner foot end attached to said shaft, adhesive applying means leading radially outwardly of said shaft from said inner foot end through said tool means and having a discharge bore through the outer surface of said tool means for discharging adhesive from said shaft onto said fibrous material, and a radially outer tip means beyond said discharge bore tapering to an outer tip, said mixing tool means in said mixing zone comprising a carrier portion fixed to the shaft and tip means mounted thereon, and cooling fluid passage means in said carrier portion, said carrier portion being in the form of an annular channel member concentric with said shaft, spokes connecting said channel member to said shaft, and means for supplying cooling fluid from said shaft through one of said spokes to said channel member and back to said shaft through another of said spokes, said shaft having a cooling fluid supplying passage connected to said one spoke and a cooling fluid return channel connected to said other spoke.

4,143,976

WASHING TRAYS

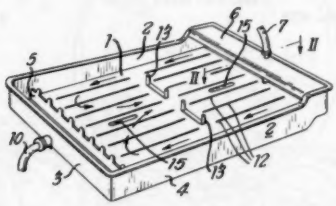
Donald M. Paterson, deceased, late of London, England, and by Ian R. E. Gow, executor, 2-6 Boswell Ct., London WC1N 3PS, England

Filed Jun. 29, 1976, Ser. No. 700,814

Claims priority, application United Kingdom, Jul. 3, 1975, 28067/75

Int. Cl.² B01F *15/02, 5/10*

U.S. Cl. 366—165 **5 Claims**



1. In a washing tray for sheet material, having a base, upstanding walls and an inlet near one end, the improvement comprising:

a weir positioned near the other end of the tray and adapted to maintain a liquid reservoir between said weir and said inlet; and

an outlet for draining liquid on the downstream side of said weir;

wherein said inlet has an angled end positioned in the angle between said base and the wall most remote from said weir, said angled end being adapted to debouch liquid onto said base and wall and cooperating therewith to cause a downstream current in said reservoir adjacent at least one of said sidewalls, said downstream current being diverted by said weir to cause an upstream current toward said inlet end in the center of said reservoir.

4,143,977

PRINT STATION APPARATUS

Tohio Kurihara, No. 2-13 Kotobuki-cho, Tokorozawa-shi, Saitama-ken; Nagao Mizutani, No. 1376-46, Sandahigashi-cho, Hachioji-shi, Tokyo; Yasuo Okawara, No. 5-80-205, 3-chome, Hibarigaoka, Hoya-shi, Tokyo; Masamitsu Nojima, 1046, Ina, Itsukaichi-cho, Nishitama-gun, Tokyo, and Masao Kunita, No. 335, Higashimitsugi, Sayama-shi, Saitama-ken, all of Japan

Filed Aug. 4, 1975, Ser. No. 601,434

Claims priority, application Japan, Aug. 7, 1975, 49-90637; Aug. 19, 1975, 49-94857; Aug. 19, 1975, 49-94858; Aug. 19, 1975, 49-94859

Int. Cl.² B41J *11/20*

U.S. Cl. 400—56 **2 Claims**

1. In a print station apparatus for holding a single sheet or a recording medium having a centerfold for printing of characters thereon by a print head, which apparatus has guide means for spacing the single sheet or the recording medium relative to the print head so that a predetermined amount of spacing is provided between the single sheet or the recording medium and the print head, a platen assembly comprising:

first and second independently movable platen units for holding the single sheet or the recording medium, a third platen unit interposed between the first and second platen units and independently movable relative to the first and second platen units for holding an intermediate portion of the single sheet or the centerfold of the recording medium, the third platen unit including first and second shoulders adapted to engage bottom surfaces of the first and second platen units, respectively, and spring means for yieldingly urging the third platen unit to urge the first and second shoulders of the third platen unit against the first and second platen units, respectively, wherein a continuous planar surface is maintained between all of the platen units when the first and second shoulders engage with the bottom surfaces of the first and second platen units, respectively.

4,143,978

ELECTRO-MECHANICAL CIPHER MACHINE

Bern Anderson, and Donald W. Seiler, both of Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

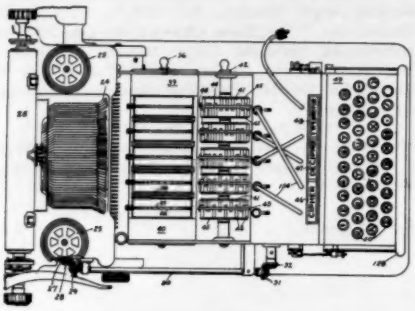
Filed May 4, 1938, Ser. No. 206,040

Int. Cl.² B41J *7/68*

U.S. Cl. 400—90 **19 Claims**

1. A cipher machine, comprising a plurality of rotatably mounted coding wheels each having ratchet teeth on its periphery and an annular series of uniformly spaced contacts on one face opposed to a like series on the opposite face, electrically conducting means randomly connecting each contact to a contact on the face of the wheel opposite thereto, a fixed spacer between each two of said wheels having through conductors to close the circuits between the contacts on the adjacent wheels, switch means having a set of contacts each providing three electrical paths corresponding to each pair of opposed contacts on a code wheel, a type bar actuating solenoid electrically connected to each of said sets of switch means contacts, a plurality of keys each carrying electric circuit closing means, a plurality of electric circuit means each connected to a set of said switch means contacts and cooperating with one of said circuit closing means, said switch means being settable to close a circuit from each key to a solenoid in either

direction through said coding wheels and spacers or directly, and means controlled by any said key when depressed to rotate



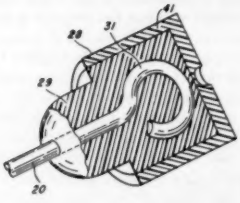
one or more of said code wheels through the angular space of one ratchet tooth, in a predeterminable variable manner.

4,143,979

PRINTHEAD NEEDLE CAP

Alfred K. Boyd, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 4, 1977, Ser. No. 793,571
Int. Cl.[2] B41J *3/10*
U.S. Cl. 400—124 **8 Claims**



1. A ballastic wire matrix printhead for a multicopy printer including a body, at least one electromagnet mounted within the body and having a blade-like armature, and at least one print member having an actuation and selectively contacted by the armature and having an impression end for contacting a print medium, the print member comprising:

(a) a needle terminating in the activation end and in the impression end;

(b) a first layer of stiff plastic material affixed to and surrounding the activation end of the needle; and

(c) a second layer of tough and abrasion resistive plastic material affixed to the first layer and positioned to be contacted by the armature.

4,143,980

SHIFTING ARRANGEMENT FOR EXACT SPACE POSITIONING OF A WRITING CARRIAGE IN TYPEWRITERS

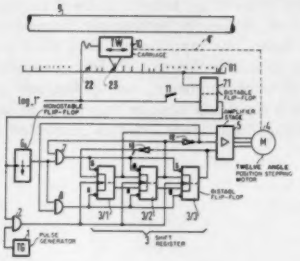
Fritz Giebler, Munich, and Oskar Hötzel, Neuried, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 17, 1977, Ser. No. 769,563
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1976, 2608754
Int. Cl.[2] B41J *19/00*
U.S. Cl. 400—322 **3 Claims**

1. A shifting arrangement for the exact space positioning of a writing carriage for typewriters which moves position-by-position alongside a record holder according to a positioning pattern defining position points, comprising

(a) a stepping motor having a rotary field and a plurality of angular positions;

(b) a positioning pattern defining a plurality of positioning points spaced a predetermined distance, a specific number of angular positions of the stepping motor which serve as basic advance positions for the rotary field of the stepping motor during running thereof being assigned to said pattern positioning points; and



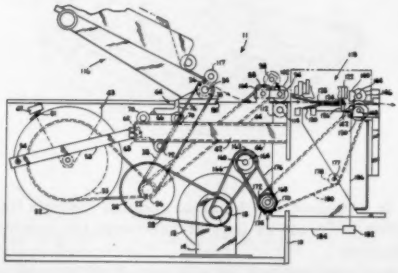
(c) electronic device means for triggering the rotary field of the stepping motor and adjusting the stepping motor rotary field to the stepping motor basic advance position which corresponds with the pattern positioning point during running of the stepping motor for compensating a load angle of the stepping motor, said electronic device means including resetting means for resetting the stepping motor rotary field at stopping from a basic advance position to a pattern positioning point at which the stepping motor rests.

4,143,981

UNIT DOCUMENT FEEDING MECHANISM

Gary G. Hansen, Byram; Leonard M. Pengue, Huntington, and Theodore Watkin, Stamford, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Aug. 6, 1976, Ser. No. 712,233
Int. Cl.[2] B41J *13/00*
U.S. Cl. 400—628 **3 Claims**



1. The combination of a printer and means for conveying sheets individually along a horizontal path to and away from the printer, the combination comprising:

A. a platform located on the horizontal path adjacent to the printer;

B. supply means located above the horizontal path for supplying sheets and having feed means for individually feeding sheets upon said platform;

C. transport means located along the horizontal path for engaging the trailing edge of a sheet to transport the sheet from a first end of said platform to a second end, said transport means being in its rest position when positioned

to act on a sheet trailing edge at the first end of said platform;

D. first means for sensing when said transport means returns to its rest position after conveying a sheet across said platform;

E. means for enabling said feed means upon sensing the return of said transport means to its rest position;

F. a printer having opposed print characters and impacters and located adjacent said second end of said platform in a position to receive sheets from said platform transported by said transport means, and comprising:

1. conveying means for conveying sheets through and away from said printer including first and second drive means, each drive means being operative to override the other when operative, said first drive means being operative when said printer is enabled and said second drive means being operative to convey a sheet away from said printer; and

2. guide means for guiding a sheet from said platform to said conveying means;

G. second sensing means for sensing the trailing edge of a sheet as it is conveyed by said conveying means away from said printer;

H. means responsive to said second sensing means for actuating said transporting means to feed a sheet across said platform to said printer upon the sensing of the trailing edge of a sheet leaving said printer; and

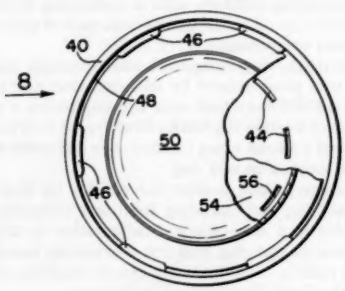
I. means for enabling said printer upon the presence of a sheet intermediate said print characters and said impacters.

4,143,982

DISPENSING BRUSH

Robert H. Cox, 33 Ferncliff Rd., Scarsdale, 10583, and Jack W. Kaufman, Merrick, both of N.Y. 11566

Filed Apr. 15, 1977, Ser. No. 787,861
Int. Cl.² A46B *11/04, 11/02*
U.S. Cl. 401—280 **3 Claims**



1. A brush dispenser comprising a tray including a bottom, spaced generally parallel openings in the bottom, said openings being longer than they are wide, bristles extending down from the bottom, and a rim extending up from the bottom, said rim surrounding the bottom at its edges,

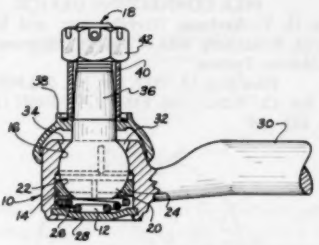
a container for discrete material to be dispensed to the bristles through the openings, means guidingly securing the container to the tray within the rim at the surface of the tray bottom opposite the bristles, a bottom for the container in sliding engagement with the tray bottom, and spaced generally parallel openings in the container bottom, said openings being longer than they are wide, the lengthwise dimensions of openings in the tray bottom and the container bottom intersecting at angles to each other and selectively aligned or misaligned upon sliding the container relative to the tray.

4,143,983

FLEXIBLE JOINT CONSTRUCTION

Victor R. McEowen, 379 Pittsfield Dr., Worthington, Ohio 43085

Continuation-in-part of Ser. No. 663,237, Mar. 3, 1976, Pat. No. 4,087,188. This application May 5, 1977, Ser. No. 793,932
Int. Cl.² F16C *11/06*
U.S. Cl. 403—39 **3 Claims**



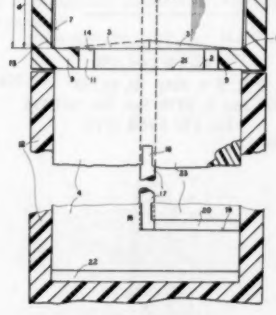
1. A pivot joint comprising, in combination, acup-shaped housing portion formed by forging a carbon steel blank including a cavity provided with an inner wall, one end of said inner wall including a spherical bearing surface integrally formed with the forging of said housing portion and machined to remove surface metal from which carbon was removed by working of the metal during forging; and a ball stud including a head portion having a headed spherical outer surface pivotally mounted on the spherical bearing surface of the housing portion, said spherical outer surface including lubricating grooves formed during the heading of the spherical outer surface of the ball.

4,143,984

CONNECTOR FOR C-PROFILE BARS

Septimius Danescu, in Webgasse 43/6, A-1060, Wien VI, Austria

Filed Jan. 10, 1978, Ser. No. 868,296
Claims priority, application Austria, Jan. 14, 1977, 209/77
Int. Cl.² F16D *39/00*
U.S. Cl. 403—194 **9 Claims**



1. A connector for coupling a structural member to a C-profile bar having an elongate channel accessible through a slot flanked by flanges of the C-profile, comprising a shank of resinous material terminating in a hammerhead, the latter being provided on a transverse surface remote from said shank with

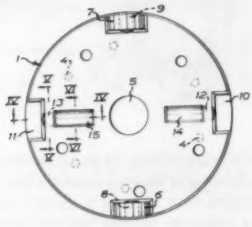
a projection adapted to dig into the material of said bar and on an opposite surface with ramp faces shaped to coact with said flanges for forcing said projection into the channel bottom upon rotation of said hammerhead in said channel following introduction thereof through said slot, said projection being integral with a metallic stem axially inserted into said shank.

4,143,985

PILE CONNECTING DEVICE

Gunborg H. V. Axelsson, Norrahammar, and Kristina E. I. Axgarde, Falkenberg, both of Sweden, assignors to AB Castings, Malmo, Sweden

Filed Sep. 13, 1977, Ser. No. 832,903
Int. Cl.[2] B25G *3/00*; F16D *1/00*; F16G *11/00*
U.S. Cl. 403—287 **9 Claims**



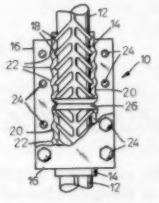
1. A pile connecting device comprising at least two complementary connecting elements, first and second locking portions on each said connecting element, each said first locking portion on a first said connecting element being received within a said second locking portion on a second said connecting element and each said second locking portion on said first connecting element receiving therewithin a said first locking portion on said second connecting element, locking holes extending through each said first and second locking portion, said locking holes in each of said first and second cooperating locking portions forming a group of holes, each said group extending radially inwardly of the periphery of said device a distance less than one-half the radius of said device, for receiving when said connecting elements are assembled, an elongated locking means extending radially through each said group of holes; a respective elongated locking means for extending radially through each said group of holes; and a recess defined by a connecting element surface extension located radially inwardly of each said group of holes, said recesses each forming a release position for receiving a said locking means whereby when said locking means are all displaced radially inwardly into said recesses, said connecting elements are disengaged.

4,143,986

REBAR SPLICE

Leon A. Antosh, R.R. # 1, Erie, Ill. 61250

Filed Jan. 9, 1978, Ser. No. 867,716
Int. Cl.[2] F16B *7/18*
U.S. Cl. 403—307 **10 Claims**



1. A connector assembly for connecting the ends of a pair of reinforcing rods having pattern deformations on the outer surfaces of the rods, said assembly including:

a pair of hollow metallic tubes adapted to be mounted on the ends of the rods, and each of said tubes being deformable to conform to the pattern deformations at the end of each of the rods and to provide a predetermined deformation on the outer surface of said tube,

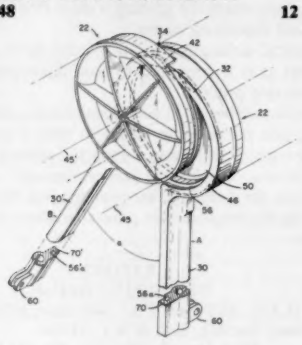
means engageable with the deformation on the outside surfaces of said tubes for connecting the rods in end to end relation.

4,143,987

CONNECTOR FOR SECTIONS OF OIL CONTAINMENT BOOM

Howard Welsh, Bothell, Wash., assignor to Bennett Pollution Controls, Ltd., North Vancouver, Canada

Filed Mar. 6, 1978, Ser. No. 883,701
Int. Cl.[2] B25G *3/00*; F16D *1/00*
U.S. Cl. 403—348 **12 Claims**



1. A connecting assembly, comprising a pair of first and second connecting members, such as connecting members for two sections of an oil containment boom, each of said connecting members comprising:

a. a base ring having a longitudinal axis generally perpendicular to a plane defined by said ring, said ring having a forward side and a back side, said ring having a connecting pivot location at a first circumferential location on said ring and a second swing location at an opposite circumferential location on said ring,

b. a first interlocking member connected to the forward side of said ring and extending from said connecting pivot location in a semi-circular configuration to said swing location on said ring, said first interlocking member having a radially inwardly facing groove extending along the length of said first interlocking member,

c. a second interlocking member connected to the forward side of said ring and extending from said connecting pivot location in a direction opposite to the first interlocking member in a semi-circular configuration to said swing location on said ring, said second interlocking member having a radially outwardly facing flange extending along the length of said second interlocking member,

d. said first and second interlocking members being aligned in parallel planes and offset from one another with respect to their axial position on said base ring,

e. said first interlocking member of the first connecting member being arranged to receive in its groove in interlocking relationship a mating flange from said second interlocking member, and said flange of the second interlocking member of the first connecting member being adapted to fit in interlocking relationship into a groove formed in said second connecting member,

f. said first interlocking member of each connecting member

being formed with a radially inwardly extending abutment face at said connecting pivot location at the location of said groove,

g. said second interlocking member of each connecting member having its flange being formed at the connecting pivot location with a radially inwardly extending second abutment face,

h. said first abutment face of each connecting member being arranged to engage said second abutment face of the other connecting member to restrict relative lateral movement between said first and second connecting members at the location of said connecting pivot location,

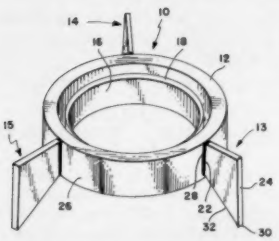
i. said second abutment face of each connecting member defining with a pivot end portion of its related first interlocking member at said connecting pivot location an access area into which a pivot end of the other connecting member may be moved axially when said first and second connecting members are offset angularly from one another, whereby said first and second connecting members can be fixedly interconnected one to another by first placing forward faces of said members opposite one another and angularly offset from one another, then moving said connecting members toward one another so that each pivot end of each first interlocking member enters into the access area of the other connecting member, so that the related flanges and grooves of the two connecting members come into alignment with one another, after which each connecting member can be moved angularly with respect to one another about said connecting pivot location toward one another so that said flanges come into interlocking relationship in the related grooves of the other connecting member.

4,143,988

MANHOLE RISER

Ralph M. Arment, Leola, Pa., assignor to Aggregates Equipment, Inc., Leola, Pa.

Filed Jul. 28, 1978, Ser. No. 928,896
Int. Cl.[2] E02D *29/14*
U.S. Cl. 404—26 **6 Claims**



1. A riser for a manhole frame comprising:

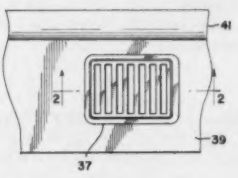
an outer ring of the same inner diameter as the manhole frame being extended, with an outer diameter approximately the same as the manhole frame being extended, and with a height equal to the anticipated depth of the new road surface to be installed; and at least three pointed trapezoidal plate anchors rigidly attached to the outer circumference of the outer ring with the points of said trapezoidal anchors extending below the lowermost surface of the outer ring.

4,143,989

ADJUSTABLE BRACE

Richard A. Prather, Hoffman Estates, Ill., assignor to Rosetti Contracting Company, Ill.

Filed Feb. 21, 1978, Ser. No. 879,348
Int. Cl.[2] E02D *29/12*
U.S. Cl. 404—72 **3 Claims**



1. The method of pouring and forming concrete gutters and curbs in a continuous operation along the edges of a roadway having storm sewers including basins disposed at spaced intervals along said edges of said roadway and cap means disposed on the top edges of said basins for covering said basins, said cap means being secured over said basins by brace means extending between said basin and said cap means, said brace means including a pipe having an angle at one end and receiving a threaded rod at the other end, said rod having a free end formed to engage with said cap means, said rod being movable within said pipe by adjustment means including a nut and washer, said nut being mateable with said rod and rotatable against said washer to cause said rod to move in and out of said pipe, said rod and said nut being removable from said pipe, said method comprising the steps of:

placing said cap means over said basins along the edges of said roadway;

inserting said brace means into said cap means so that the end of said pipe having said angle is disposed adjacent an edge of said basin and said free end of said rod is disposed adjacent said cap means opposite said edge of said basin;

striking said nut against said washer for forcing said pipe and angle into positive contact with said edge of said basin;

rotating said nut against said washer for extending said rod outwardly from said pipe so that said free end of said rod contacts said cap means;

pouring a layer of concrete in a continuous length along the edges of said roadway and around said cap means; and,

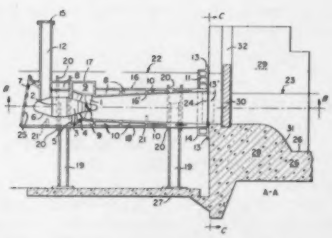
forming said layer of concrete into gutters and curbing.

4,143,990

DAM WITH MOVABLE HYDROELECTRIC ASSEMBLY

Francisco J. G. Atencio, Estafeta Dr. Garcia, Diamante Entre Rios, Argentina

Filed Apr. 29, 1977, Ser. No. 792,493
Int. Cl.[2] E02B *9/00*
U.S. Cl. 405—78 **12 Claims**



1. A water storing dam including a main body, means for directing a fluid flow through said dam main body, one or more hydromotive assemblies positioned against said dam main

body, each said hydromotive assembly having an internal conduit defining a fluid flow circulation path for directing a flow of water therethrough, an energy generation unit having at least one component within said conduit, said hydromotive assembly having a first open end and a second open end for discharging water flow entering said first open end and transversing said conduit, one of said open ends adapted to be positioned adjacent said dam fluid flow directing means and means mounting said hydromotive assembly adjacent said dam main body, said mounting means including means controllably movably displacing said hydromotive assembly relatively said main body of said dam.

4,143,991

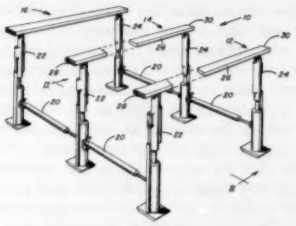
MINE ROOF SUPPORT SYSTEM

Frank Stafford, P.O. Box 67, Keyser, W. Va. 26726

Filed May 24, 1978, Ser. No. 909,262

Int. Cl.[2] E21D *15/44*

U.S. Cl. 405—291 **10 Claims**



1. A mine roof support system comprising,

a plurality of truss members each having first and second end portions, said truss members being positioned in spaced relation and adapted to be positioned abutting a mine roof,

a plurality of prop members each having an upper end portion, an extensible portion, and a base portion,

said base portion being adapted to support said respective prop member for slidable movement on a mine floor,

one of said prop members being positioned under each end of each truss member so that a pair of said prop members is associated with each of said truss members,

said prop member upper end portion being connected to said respective truss member,

said prop members at said first end portions of said truss members forming a first set of prop members,

said prop members at said second end portions of said truss members forming a second set of prop members,

said prop members of said first set being positioned in spaced tandem relation and said prop members of said second set being positioned in spaced tandem relation,

telescoping means for connecting adjacent prop members of said first set and adjacent prop members of said second set to permit movement of one pair of said prop members relative to the other pairs of said prop members, and

stabilizing means extending between each truss member and said upper end portion of each prop member for stabilizing said truss member above said prop member.

4,143,992

WIND OPERATED POWER GENERATOR

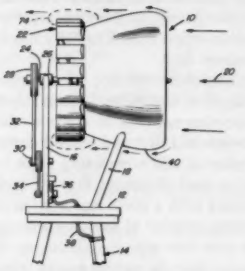
Charles W. Crook, Rte. 1, Box 35, Earle, Ark. 72331

Filed Nov. 29, 1977, Ser. No. 855,912

Int. Cl.[2] F03D *7/00*

U.S. Cl. 415—2 **14 Claims**

1. In a wind turbine assembly from which power is taken having a rotor adapted to be mounted for rotation about an axis substantially parallel to the direction of airflow, a plurality of vanes carried on said rotor in radially spaced relation to said axis, flow controlling duct means mounted in operative relation to the rotor for conducting a radial outflow of air against said vanes to induce rotation of the rotor, and airfoil surface means mounted externally on the duct means for producing a



low pressure region within which said vanes are positioned by the rotor to enhance rotation thereof in response to inflow of the air through the duct means.

4,143,993

SUCTION PUMP WITH ROTATABLE FLOW RETAINING AND REPELLING ELEMENT

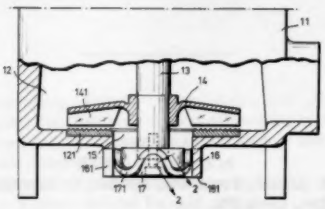
Albert Blum, Scheiderhöhe, 5204 Lohmar 1, Fed. Rep. of Germany

Filed Dec. 2, 1976, Ser. No. 746,801

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1976, 2612910

Int. Cl.[2] F04D *7/04*

U.S. Cl. 415—121 B **28 Claims**



1. A suction pump assembly comprising an electric motor, a pump and a housing; a suction opening in said housing, and comminuting means disposed contiguous said suction opening for comminuting sucked-in admixtures flowing through said suction opening, said comminuting means including rotatable means for alternately retaining and repelling the flow of the admixtures through the suction opening and counter-acting the suction of said pump.

4,143,994

TURBINE HOUSING FOR CENTRIFUGAL TURBOSUPERCHARGER

Hiromasa Yamaguchi, Tokyo, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 2, 1977, Ser. No. 792,984

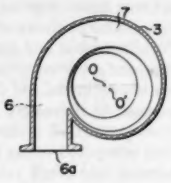
Claims priority, application Japan, Nov. 30, 1976, 51-159210

Int. Cl.[2] F01D *25/24*

U.S. Cl. 415—205 **1 Claim**

1. In a turbine housing for a centrifugal turbosupercharger including a spiral wall defining a gas passage through which exhaust gas from an engine passes, an inlet for exhaust gas formed integrally with said spiral wall, an outlet for exhaust gas formed integrally with said spiral wall and a partition wall for dividing said gas passage into two sections, said partition wall being formed integrally with said spiral wall wherein the improvement is characterised in that the height of said partition wall gradually decreases in the downstream direction in

such a manner that the gap between the outer periphery of a turbine rotor and the tip of said partition wall reaches a maximum at about 225° as measured from an intersection of the



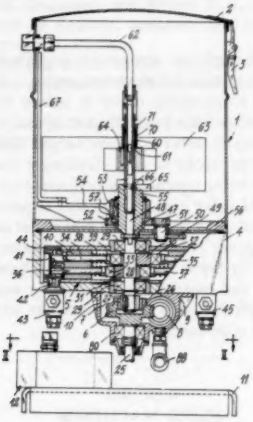
inner periphery of the partition wall and a line passing through the centre of the turbine rotor and drawn perpendicular to the direction of introduction of exhaust gas.

4,143,995

SINGLE DRIVE MOTOR DEVICE PARTICULARLY TO SUPPLY FLUID CONVEYANCE TANDEM LINE SYSTEMS

Gualtiero Divisi, Milan, Italy, assignor to Dropsa S.p.A., Italy

Continuation-in-part of Ser. No. 640,966, Dec. 15, 1975, abandoned. This application May 18, 1977, Ser. No. 798,096
Claims priority, application Italy, May 15, 1975, 23352 A/75
Int. Cl.[2] F04B *49/00, 1/04;* F16N *7/14*
U.S. Cl. 417—3 **7 Claims**



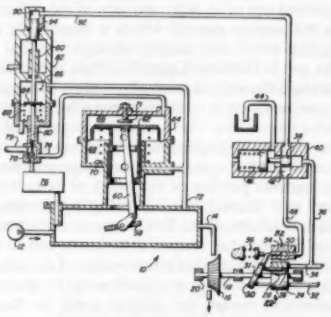
1. In a system for delivering fluid under pressure, pump means for pumping the fluid, valve means communicating with said pump means for receiving fluid under pressure therefrom, said valve means having a pair of positions, a pair of conduit means communicating with said valve means for receiving fluid under pressure therefrom and for conveying the fluid under pressure to predetermined locations, said valve means in one of its positions delivering fluid under pressure to one of said conduit means and in the other of its positions delivering fluid under pressure to the other of said conduit means, valve-operating means operatively connected with said valve means for moving the latter between said positions thereof, reversible drive means for providing a drive in a pair of opposed directions, a pair of one-way drive clutch means both connected operatively with said reversible drive means to be operated thereby and respectively connected operatively with said pump means and said valve-operating means for transmitting a drive from said drive means to said pump means when said drive means operates in one direction and for transmitting a drive from said drive means to said valve-operating means when said drive means operates in an opposite direction, a pair of pressure-responsive means operatively connected with said pair of conduit means for detecting when the pressure of the fluid conveyed therethrough reaches a given value and for responding to reaching of said given value for reversing the driving direction of said drive means, and a pair of detecting means for detecting when said valve means has reached said positions thereof and for again reversing the driving direction of said drive means when the position of said valve means has been changed, whereby when said valve means is in one of its positions and said pump means is operated by said drive means through one of said clutch means fluid under pressure will be delivered to one of said conduit means to be conveyed therethrough until the pressure-responsive means operatively connected with said one conduit means detect that said given pressure has been reached whereupon the latter pressure-responsive means will reverse said drive means to terminate the operation of said pump means while bringing about operation of said valve-operating means through the other of said clutch means to change the position of said valve means until one of said detector means detects that the position of the valve means has been changed and again reverses said drive means to resume operation of said pump means with delivery of fluid under pressure through said valve means to the other of said conduit means until the pressure-responsive means connected to said other conduit means detects that the given pressure has been reached and reverses said drive means for again terminating the operation of said pump means while resuming operation of said valve-operating means to change the position of said valve means back to the first position thereof, the other detector means detecting when the latter first position of said valve means has been reached for terminating the operation of said valve-operating means and again resuming the operation of said pump means.

4,143,996

HYDRAULIC CONTROL SYSTEM AND METHOD

Richard N. Sullivan, Tempe, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 23, 1976, Ser. No. 754,053
Int. Cl.[2] F04B *49/00*
U.S. Cl. 417—15 **21 Claims**



1. Apparatus for controlling a variable displacement hydraulic pump driven by a variable speed input shaft to develop a pressurized output fluid flow and including an element adjustably positionable to vary pump displacement, comprising:

first sensing means for sensing pressure of said pump output flow;

first control means for adjusting the position of said element in response to said first sensing means;

second sensing means for sensing said position of the element; and

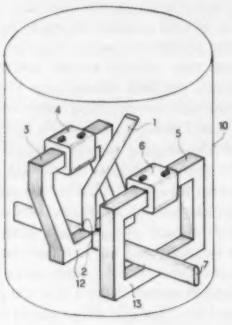
second control means responsive to said second sensing means for adjusting the speed of said shaft in proportion to said sensed position.

4,143,997

ELECTROMAGNETIC INDUCTION PUMP FOR MOLTEN METAL INCLUDING IMPURITIES

Richard Deshais, Paris, France, assignor to Novatome Industries, Le Plessis Robinson, France

Filed Jul. 19, 1977, Ser. No. 816,989
Claims priority, application France, Jul. 30, 1976, 76 23374
Int. Cl.[2] H02N 4/20
U.S. Cl. 417—50 4 Claims



1. An electromagnetic induction pump for molten metal including impurities immersible in said molten metal, encased in a block of refractory material which is inert with respect to said molten metal and comprising at least two distinct magnetic circuits and two inter-connecting conduits; said magnetic circuits comprising:

a first magnetic circuit including a horizontal arm provided with a gap, and

at least one second magnetic circuit which is closed and provided with a winding for inducing magnetomotive force therein, said two inter-connecting conduits comprising:

a first conduit which passes through said gap in the first magnetic circuit and being substantially vertical in the gap;

a second conduit which is substantially horizontal and opening out of at least one side of the refractory block in the portion thereof which is immersible within said molten metal and passing through the first conduit at the gap in the first magnetic circuit, and being threaded through the second magnetic circuit, bearing an electric current which is induced therein by said second magnetic circuit and whose circuit is completed in the molten metal, the improvement wherein the second, horizontal conduit opens out at both its opposite ends in the immersible portion of the block of refractory material and said second conduit being perpendicular to the horizontal arm of the first magnetic circuit, and wherein said first conduit is open at its lower end to the interior of the second conduit intermediate of its ends and at said gap, such that flow of molten metal by electromagnetic induction causes the molten metal to flow into the interior of the second conduit from both of its opposite ends and to flow vertically upwardly into the lower end of said first conduit at said gap.

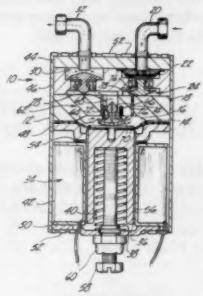
4,143,998

FLUID PUMP

Alton J. O'Connor, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Continuation of Ser. No. 583,532, Jun. 4, 1975, abandoned. This application Feb. 11, 1977, Ser. No. 767,805
Int. Cl.[2] F04B 43/00
U.S. Cl. 417—413 8 Claims

1. A pump for liquids having a pump chamber, inlet and outlet check valves, inlet and outlet passages communicating with said pump chamber through said inlet and outlet check valves respectively, a diaphragm cooperating with said pump chamber and said check valves to admit liquid through said inlet passage into said chamber on an intake stroke of said diaphragm and to discharge liquid from said chamber through said outlet passage on a discharge stroke of said diaphragm, a solenoid having an electromagnetic coil and an armature connected to said diaphragm and received within said electromagnetic coil to alternately impart intake and discharge strokes to said diaphragm in response to alternately energizing and de-energizing said electromagnetic coil, a valve seat in a wall of said pump chamber and interposed in the flow path of liquid through said pump between said check valves, a valve within said pump chamber and constructed and arranged such that



when intake and discharge strokes are imparted to said diaphragm by said armature and electromagnetic coil said valve is yieldably biased to normally move in unison with said diaphragm and be reciprocated with respect to said seat to permit liquid in said pump chamber to be discharged from said chamber on a discharge stroke of said diaphragm and when said diaphragm is not being operated by said armature and electromagnetic coil said valve engages said seat to prevent the flow of liquid from said chamber through said outlet passage to the exterior of said pump even when said diaphragm is displaced from said valve by liquid admitted to said chamber through said inlet valve, and means yieldably biasing said diaphragm toward the completion of its discharge stroke when said electromagnetic coil is de-energized.

4,143,999

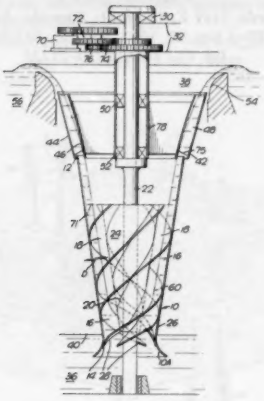
FLUID MACHINES

Michael L. Ryall, Glasgow, Scotland, assignor to Weir Pumps Limited, Glasgow, Scotland

Continuation-in-part of Ser. No. 561,058, Mar. 24, 1975, abandoned. This application May 11, 1977, Ser. No. 796,020
Claims priority, application United Kingdom, Apr. 9, 1974, 15563/74; Sep. 24, 1974, 41472/74
Int. Cl.[2] F04B 17/00
U.S. Cl. 417—424 10 Claims

1. A rotary cone pump for raising liquid from a lower reservoir to an upper reservoir, said pump having an inlet for receiving liquid from the lower reservoir and an outlet vertically spaced from the inlet for discharging into said upper reservoir, a rotor mounted on a vertical shaft and including series of axially extending helical vanes the outer diameter of which increases upwardly, a frusto-conical outer shroud surrounding said vanes, the vanes defining with the shroud a plurality of fluid passages extending a sufficient axial distance along the rotor whereby during pumping of liquid in said passages the liquid forms a vortex against the outer shroud, such that a free liquid surface is formed on the radially inner boundary of the vortex, diffuser means above said rotor to receive liquid from the vanes and extending longitudinally thereof and having an

outer radius which increases upwardly, and a drive transmission for coupling the diffuser means to a drive motor so that



the diffuser means is driven by the drive motor at a speed less than that of the rotor.

4,144,000

FUEL PUMPING APPARATUS

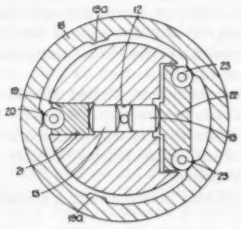
Reginald Hollett, Rochester, and Robert T. J. Skinner, High Wycombe, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Jan. 20, 1978, Ser. No. 870,874

Claims priority, application United Kingdom, Jan. 28, 1977, 3472/77

Int. Cl.[2] F04B *29/00*

U.S. Cl. 417—462 **8 Claims**



1. A fuel injection pumping apparatus for supplying fuel to an internal combustion engine and of the kind comprising a body part, a rotary member mounted within the body part and arranged in use to be driven in timed relationship with the associated engine, a pair of plungers mounted in a transversely extending bore in the rotary member, an annular cam ring mounted within the body part, cam lobes angularly positioned about the internal periphery of the cam ring, roller means positioned intermediate the plungers and the cam, passage means for conveying fuel displaced from the bore to a plurality of outlets in turn during successive inward displacements of the plungers and further passage means for supplying fuel to the bore, characterised in that for supplying fuel to a five cylinder engine, five cam lobes are equiangularly spaced about the rotary member and said roller means comprises a first roller mounted in a shoe acting on one of said plungers, the other plunger being engaged by a member extending generally transversely of the axis of movement of the plunger, said member being operated by a pair of rollers which are spaced apart by an amount such that they engage a pair of adjacent cam lobes whereby the plungers will be moved inwardly five times per revolution of the rotary member.

4,144,001

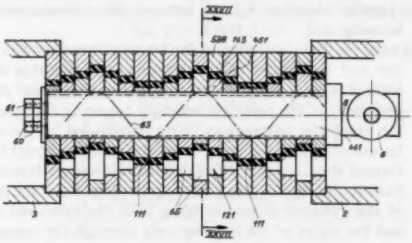
ECCENTRIC WORM PUMP WITH ANNULAR WEARING ELEMENTS

Max Streicher, Oderstrasse 28, D-7988 Wangen, Allgäu, Fed. Rep. of Germany, assignor to Fördertechnik Streicher GmbH, Bad Schussenried and Max Streicher, Wangen, Allgäu, both of, Fed. Rep. of Germany

Filed Mar. 29, 1977, Ser. No. 782,525

Int. Cl.[2] F01C *1/10, 5/00, 21/08, 21/10*

U.S. Cl. 418—48 **39 Claims**



1. An eccentric worm pump comprising, in combination: a helical worm rotor having step-shaped staggered ring surfaces; a stator; said helical worm rotor rolling off planetarily in a multi-thread hollow helix formed by step-shaped staggered loop surfaces of said stator; said helix being adapted to the cross-section and pitch thereof; helical cavities between the rotor and the opposite part of the helix being formed and moved from an intake end to a delivery end of said stator; a plurality of interchangeable annular wearing elements in a roll-off track between rotor and stator, said interchangeable annular wearing elements being arranged axially staggered; said wearing elements comprising collars axially supported by said rotor and rotatably adjustable relative to one another and to said rotor; said step-shaped staggered ring surfaces of said rotor, said annular wearing elements and said step-shaped staggered loop surfaces of said stator having substantially equal widths, said wearing elements rolling in curvature of the stator and rotating on said rotor.

4,144,002

ROTARY COMPRESSOR

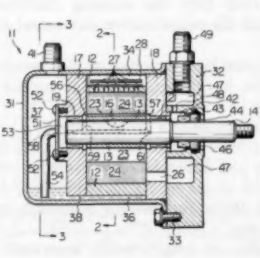
Tsunenori Shibuya; Yutaka Ishizuka, and Teruo Nakamura, all of Konan, Japan, assignors to Diesel Kiki Company, Ltd., Tokyo, Japan

Filed May 10, 1977, Ser. No. 795,627

Claims priority, application Japan, May 15, 1976, 51/61853[U]

Int. Cl.[2] F01C *21/04;* F04C *29/02*

U.S. Cl. 418—76 **4 Claims**



1. A rotary compressor comprising:

a bored cylinder formed with an inlet and an outlet;

a rotor operatively disposed in the bore of the cylinder for compressing fluid therein;

a housing enclosing the cylinder and being formed with an inlet and an outlet;

a passageway connecting the inlet of the housing to the inlet of the cylinder;

a lubricant sump defined by a lower portion of the housing, the outlet of the housing communicating with the lubricant sump;

a lubricant passageway leading from the lubricant sump through the rotor to the inlet of the cylinder;

an expansion passageway defined within the housing connecting the outlet of the cylinder with the lubricant sump;

an annular chamber defined between the cylinder and the housing; and

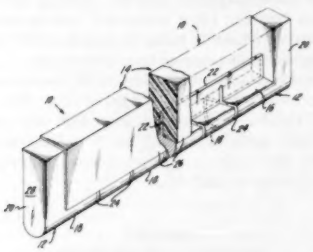
an axial partition provided in the housing between the cylinder and the outlet of the housing, the partition being formed with a hole therethrough, the remainder of the periphery of the partition sealingly engaging the housing, the expansion passageway being constituted by the annular chamber and the hole, the outlet of the cylinder being formed at an upper portion thereof, a lower portion of the partition being cut away to constitute the hole, the outlet of the cylinder communicating with the lubricant sump and the outlet of the housing only through the expansion passageway.

4,144,003

BAR TYPE SEAL FOR ROTARY MECHANISM

Murray Berkowitz, Woodcliff Lake, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Nov. 23, 1977, Ser. No. 854,056
Int. Cl.[2] F01C *19/06*
U.S. Cl. 418—113 **14 Claims**



1. A bar seal for use in a rotary mechanism having a housing defining a multi-lobe cavity in which cavity a rotor is supported for planetary rotation relative to the housing and defines with the housing a plurality of working chambers which expand and contract in volumetric size upon rotation of said rotor and which mechanism has intake and discharge ports for respectively receiving fluid into the working chambers and discharging fluid from the working chambers, the bar seal being disposed for reciprocative movement in a groove and comprises:

a) an elongated base structure of high wear-resistance characteristics, having a sealing edge surface extending substantially its entire length,

b) a body structure of a material having a low coefficient of friction connected to said base structure to form a unitary assembly and dimensioned to extend a substantial part of the length of the base structure and of a width to form opposite planar surfaces for contacting the walls of said groove, and

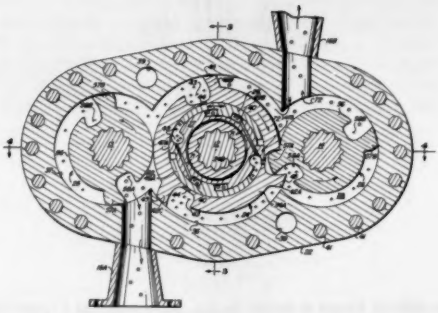
c) a plurality of longitudinally separated gaps extending generally transversely of the length of the base structure for receiving therein portions of said body structure and forming thereby a series of joints interlocking said base and body structures together and providing longitudinal flexibility of the assembly.

4,144,004

INTERMESHING GEAR ROTARY ENGINE WITH VALVED INLET

Ray B. Edwards, 1121 E. Tonto St., Phoenix, Ariz. 85034

Filed Sep. 29, 1977, Ser. No. 837,712
Int. Cl.[2] F01C *1/20, 21/12*
U.S. Cl. 418—185 **5 Claims**



1. A rotary engine comprising:

a housing defining at least two intersecting coplanar arranged cylindrical bores,

first and second rotor means journaled in said housing one in each of said bores,

a pair of intermeshing gears one mounted on the end of each of said rotor means,

said rotor means each being contoured to provide around its periphery at least a pair of spaced dual purpose vanes for interlocking with the other vanes of the other rotor means upon rotation of said first rotor means and to provide a first vapor chamber means between one vane of each rotor means and another vane of the other rotor means and the periphery of the bore within which the associated rotor means rotates,

said first rotor means being slotted to receive within the slot a pair of coaxially arranged collars,

one of said collars being fixedly attached to said housing and the other of said collars being adjustably movable relative to said first collar,

said collars defining between them a second vapor chamber means,

passage means selectively interconnecting said first chamber means with said second chamber means, means on said collars forming at least one void when said other collar is moved relative to said first collar,

passage means through one of said collars for equalizing the pressure between said second vapor chamber means and any void existing between said collars,

said rotor means meeting in rolling contact throughout the remainder of their periphery when the vanes are not interlocked,

said rolling contact providing a fixed portion of said first and second chamber means,

said second vapor chamber means being a non-expansion vapor storage chamber assuring a constant source of supply for said first vapor chamber means which is an expansion chamber,

means connected to said other collar for selectively moving said other collar relative to said first collar for controlling vapor flow into said second chamber means,

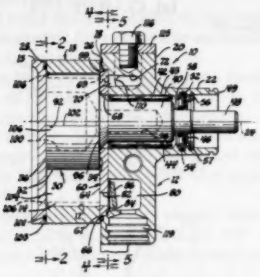
an inlet vapor port connected to said second vapor chamber means, and

an outlet vapor port connected to said first vapor chamber means.

4,144,005
ROTARY THROUGH VANE COMPRESSOR

Byron L. Brucken, Miamisburg, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 1, 1977, Ser. No. 856,317
Int. Cl.[2] F04C 17/00, 29/08
U.S. Cl. 418—255 1 Claim

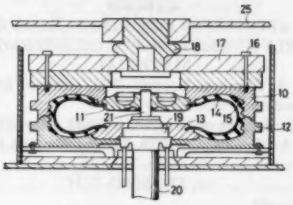


1. In a rotary compressor of the through vane type including a cylindrical rotor housing section defining a working chamber, said rotor housing section having open ends terminating in forwardly and rearwardly directed peripheral edges, a rotor having a substantially cylindrical peripheral surface and opposed front and rear faces mounted for rotation in said working chamber on an axis eccentric to said cylindrical rotor housing section, a pair of diametrical intersecting slots formed in said rotor, a through vane slidably mounted in each said slot and having a predetermined length dimension, the wall of said working chamber at opposite sides thereof having a contour generated at the ends of a constant length dimension line through said eccentric axis of rotation of said rotor so as to maintain the vane opposite edges in contact with said working chamber wall, the improvement wherein said rotor has an integral drive shaft extending forwardly from its front face, a front cylindrical head section having a longitudinal through bore aligned on said eccentric axis, said front head section having a forwardly directed outer surface formed with a protruding integral tubular extension thereon aligned on said eccentric axis, said head section having a rearwardly directed planar face formed with an annular recess of a predetermined depth, a suction cavity and a discharge cavity formed in said head section, each said suction and discharge cavity having an open side located in said recess, a combined working chamber front cover and valve plate positioned in said recess between said head and rotor sections, said plate having a thickness substantially equal to but greater than the depth of said recess whereby the exposed face of said plate extends a predetermined distance beyond said front head section planar face so as to provide a common plane sealing surface at the jointure of said plate and said rotor housing section forward peripheral edge, a rear cover plate positioned in flush sealing engagement with said rotor section rearward facing peripheral edge, said valve plate having first aperture means communicating with said suction cavity and said working chamber, said valve plate having second aperture means communicating with said discharge cavity and said working chamber, discharge valve means on said valve plate operative to control flow through said second aperture means, said front head section having first and second passage means communicating with said suction and discharge cavities, said valve plate having an eccentric opening therethrough, said rotor drive shaft extending through said valve plate eccentric opening and received in said head section through bore such that said tubular extension surrounds a portion of said rotor drive shaft free end, means interconnecting said front head section, said rotor housing section and said rear cover plate; single journal bearing means positioned in said through bore around said rotor drive shaft whereby said rotor is rotatably supported in cantilevered fashion in said working chamber on said eccentric axis, and said rotor intersecting slots open throughout their diametrical extent to said rotor rear face whereby said through vanes are removably retained in said intersecting slots in the rearward direction solely by said rear cover plate.

4,144,006
METAL MOLD FOR VULCANIZATION OF TIRES

Munenori Iuchi, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Filed Feb. 21, 1978, Ser. No. 879,422
Claims priority, application Japan, Feb. 21, 1977, 52-18376
Int. Cl.[2] B29H 5/02
U.S. Cl. 425—33 2 Claims

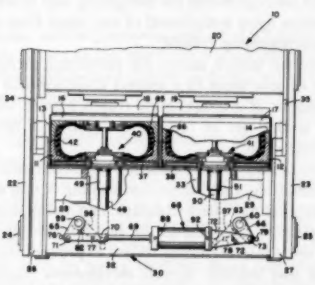


1. In a metal mold for vulcanization of a tire, to be mounted on a press machine of the type having a base, a vertically movable cylinder having a piston rod, a vertically movable top link and an upper platen connected to said top link, said vulcanization mold including an upper half mold having peripheral portion secured to said upper platen, a lower half mold, an upper bead ring secured to an end of said piston rod, a lower bead ring secured to an end of said cylinder and a bladder supported between said bead rings, an improvement characterized by said upper half being composed of coaxially arranged inner and outer mold portions, a contacting face of said inner mold portion to said outer mold portion being tapered downwardly so as to allow a downward movement of said inner mold portion independent of said outer mold portion, said inner mold portion being provided with a connecting portion to which a driving member for selectively driving said inner mold portion is secured.

4,144,007
TIRE STRIPPING MECHANISM FOR DUAL CAVITY TIRE PRESS

Anand P. Singh, Youngstown, Ohio, assignor to NRM Corporation, Akron, Ohio

Filed Dec. 5, 1977, Ser. No. 857,239
Int. Cl.[2] B29C 7/00; B29H 5/08
U.S. Cl. 425—34 R 22 Claims



1. A dual cavity tire press for curing two tires in side-by-side relationship, each cavity including a bottom mold section, vertically movable tire stripping mechanisms extending through said bottom mold section and operative when moved

upwardly to strip a tire from the respective bottom mold sections, and a single piston-cylinder assembly extending between said mechanisms for moving the same vertically with its rod connected to one and its cylinder connected to the other.

4,144,008

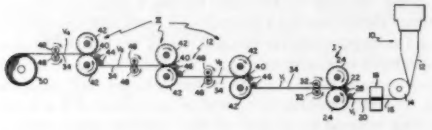
APPARATUS FOR STRETCHING A TUBULARLY-FORMED SHEET OF THERMOPLASTIC MATERIAL

Eckhard C. A. Schwarz, Neenah, Wis., assignor to Biax-Fiberfilm Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 563,623, Mar. 31, 1975, and Ser. No. 614,018, Sep. 17, 1975. This application Feb. 9, 1977, Ser. No. 766,926

Int. Cl.[2] B29D *7/24*

U.S. Cl. 425—66 **3 Claims**



1. An apparatus for producing thermoplastic bags which comprises:

(a) means for extruding a tube of orientable polymeric material;

(b) means for forming said tube into a sheet;

(c) means for heat sealing said sheet at preselected portions thereof;

(d) a first station means for stretching incremental portions of said sheet in a first direction and including a first set of interdigitating rollers formed with grooves, said first set of interdigitating rollers forming a nip therebetween;

(e) first regulator means for controlling the velocity of introduction of said sheet into said nip of said first set of interdigitating rollers to assume and maintain said velocity substantially identical to the surface velocity of said first set of interdigitating rollers to prevent slipping of said sheet and thereby stretch incremental portions of said sheet by a deflection of said sheet into said grooves;

(f) a first take-up means for elongating said sheet in said first direction upon withdrawal of said sheet from said first set of interdigitating rollers;

(g) a second station means for stretching incremental portions of said sheet in a second direction and including a second set of interdigitating rollers formed with grooves, said second set of interdigitating rollers forming a nip therebetween;

(h) a second regulator means for controlling the velocity of introduction of said sheet into said nip of said second set of interdigitating rollers to assume and maintain said velocity substantially identical to the surface velocity of said second set of interdigitating rollers to prevent slipping of said sheet and thereby stretch incremental portions of said sheet by a deflection of said sheet into said grooves.

(i) a second take-up means for elongating said sheet in said second direction upon withdrawal of said sheet from said second set of interdigitating rollers; and

(j) means for receiving said sheet.

4,144,009

APPARATUS FOR PRODUCTION OF METAL STRIP

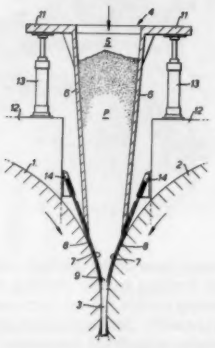
George Jackson, Dronfield Woodhouse, and John Wooddisse, Hathersage, both of England, assignors to British Steel Corporation, London, England

Filed Jul. 18, 1977, Ser. No. 816,796

Claims priority, application United Kingdom, Jul. 16, 1976, 29776/76

Int. Cl.[2] B22F *3/18*

U.S. Cl. 425—79 **15 Claims**



1. Apparatus for compacting particulate metalliferous material into strip form comprising a pair of compaction rolls having end faces mounted with their rotational axes spaced in a horizontal plane to define a roll gap therebetween, movable endless belts positioned one at each end of the roll gap in engagement with the end faces of the rolls to close off the end zones of the roll gap, a hopper having a discharge orifice for feeding particulate material into the roll gap mounted with said discharge orifice positioned above and extending across the full length of the roll gap the hopper having side walls with lower margins extending along the length of the roll gap, a shielding plate assembly extendable below and adjacent the lower margin of each side wall of the hopper, means for effecting relative movement between the shielding plate assemblies and the hopper side walls whereby the lower margin of each shielding plate assembly can protrude at least partially below the lower margin of the respective hopper side wall to define the lengthwise extending boundaries of the discharge orifice of the hopper, and means extendable into the area above the end zones of the roll gap below the hopper for restricting the flow of particulate material into the end zones of the roll gap adjacent the end faces of the rolls to counteract the tendency of particulate material to be drawn into these end zones by the endless belts thereby to maintain the rate at which particulate material enters the roll gap substantially uniform along its entire length.

4,144,010

METHOD OF AND APPARATUS FOR INJECTION MOLDING OF INJECTION MOLDED PARTS CONTAINING IMBEDDED INSERTS

Werner Fenner, Schneisingen, Switzerland, assignor to Bucher-Guyer AG, Maschinenfabrik, Niederweningen, Switzerland

Filed May 2, 1977, Ser. No. 793,057

Int. Cl.[2] B29F *1/00*

U.S. Cl. 425—125 **3 Claims**

1. An apparatus for injection molding injection molded parts provided with insert elements imbedded therein, especially injection molded parts formed of a thermosetting plastic, comprising:

a stationary mold support plate;

a movable support plate;

means connected to said movable support plate for moving

the same toward and away from said stationary mold support plate;

a first mold half mounted on said stationary mold support plate;

an injection nozzle operatively connected to said first mold half;

a support table;

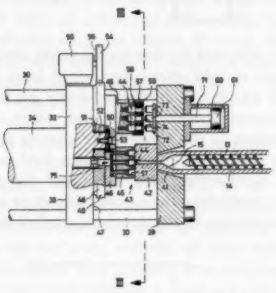
means for rotatably mounting said support table on said movable support plate;

a pair of second mold halves mounted on said support table substantially diametrically opposite to each other relative to said mounting means;

a plurality of mold cavities in each second mold half, the mold cavities of each second mold half being arranged in substantially the same pattern;

means mounted between said stationary mold support plate and said support table for delivering and introducing insert elements into the mold cavities of a respective second mold half;

means operatively connected to said support table for rotating said support table stepwise through 180° about said mounting means such that one of said second mold halves



confronts said first mold half and the other second mold half confronts said delivering and introducing means;

said delivering and introducing means comprising a plurality of insert element holders, each of which includes means for releasably holding a plurality of insert elements in a pattern corresponding to the pattern of the mold cavities of said second mold halves, means for guiding and positioning said insert element holders sequentially in confronting relation with said other second mold half, reciprocating ram means mounted on said stationary mold support plate for simultaneously removing the insert elements from the insert element holder confronting said other second mold half and for transferring such insert elements into respective mold cavities of said other second mold half; and

control means operatively connected to said support plate moving means, injection nozzle, ram means and support table rotating means for simultaneously operating said injection nozzle and ram means when said movable support plate is moved toward said stationary mold support plate and for operating said support table rotating means when said movable support plate is moved away from said stationary mold support plate.

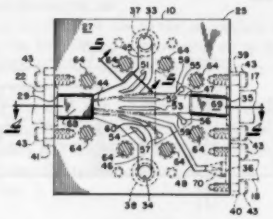
4,144,011

FEEDBLOCK AND DIE ASSEMBLY

Lloyd B. Sponaugle, Akron, Ohio, assignor to NRM Corporation, Tallmadge, Ohio

Filed Apr. 8, 1977, Ser. No. 785,879
Int. Cl.² B29D *7/02*
U.S. Cl. 425—192 R **15 Claims**

1. A feedblock and die assembly for co-extrusion of a multilayer article comprising a first die body having a discharge passage channel in a first face of said body, a cover die plate having a mating face for engagement with said first face to cover said discharge passage channel and provide a single enclosed discharge passage, a plurality of feed openings in said die body in communication with said discharge passage, connecting passages in said feedblock between said feed openings and said discharge passage for communicating material from



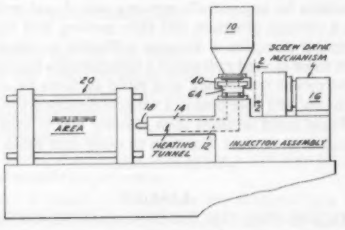
said feed openings to said discharge passage, a discharge opening in said feedblock in communication between said discharge passage and a die, and said cover die plate being connected to said die body by fasteners positioned so that said cover die plate can be removed without breaking the connection between said die body and said discharge conduit.

4,144,012

MATERIAL HOPPER TRANSLATABLE UNIT

Paul D. Pinkley, 36538 Farmbrook Dr., Mount Clemens, Mich. 48043

Filed Aug. 5, 1977, Ser. No. 822,065
Int. Cl.² B29F *1/08*
U.S. Cl. 425—225 **10 Claims**



1. In a plastic molding machine including a hopper for containing plastic pellets or the like surmounting the material inlet opening of the machine and further including a valve member at the discharge end of the hopper which in one position opens the discharge end of the hopper for flow of the plastic pellets into the machine and in another position closes the discharge end of the hopper against such flow, the combination of:

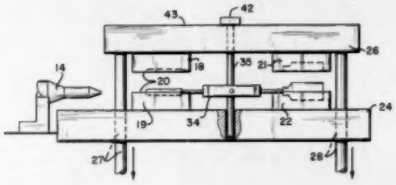
means forming a track leading laterally away from the inlet opening of the machine to a drain outlet, and

means at the discharge end of the hopper engaging the track and providing bodily translatable movement of the hopper together with its valve member along the track to the drain outlet and return, said valve member being normally closed during its bodily translatable movement but operable at the drain outlet to open the discharge end of the hopper for draining unused plastic pellets retained in the hopper.

4,144,013
INJECTION BLOW MOLDING METHOD AND APPARATUS

John B. Simmons, Wigan, Northern Ireland, assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Dec. 1, 1977, Ser. No. 856,813
Int. Cl.[2] B29D 23/03
U.S. Cl. 425—533 6 Claims



1. An injection blow molding apparatus for forming containers of plastic material comprising:

(a) a plurality of core pins extending radially from an axial mounting boss, said boss being mounted for rotation to permit said core pins to be moved radially in a substantially horizontal plane.

(b) an injection mold having two mold sections adapted to be separated from each other along a horizontal parting line to open said mold and adapted to be associated with said core pins and an extruder for injection molding plastic parisons into said core pins.

(c) at least one blow mold cavity formed by two mold sections adapted to be separated from each other along a horizontal parting line to open said cavity and adapted to be associated with said core pins for blow molding a plastic container from said parison material.

(d) stripper means for removing said blow molded plastic containers from said core pins.

(e) means for sequentially rotating said core pin boss from said injection mold to said blow mold and then to said stripper means. '(f) means for opening and closing said mold sections including means for opening said mold sections by sequentially moving one of said mold sections in a vertical direction and then moving said core pin in a vertical direction a distance sufficient to allow said core pin to be moved radially in a substantially horizontal plane and means for closing said mold sections by sequentially moving said core pins in a vertical direction to contact one of said mold sections then moving one of said mold sections in a vertical direction to close said mold.

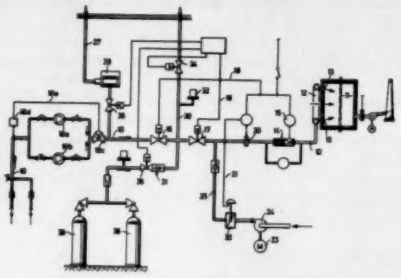
4,144,014
PROCESS FOR THE THERMAL COMBUSTION OF WASTE GASES AND THERMAL AFTER-BURNING PLANT FOR CARRYING OUT SAID PROCESS

Jost W. Hartwig, Frenkendorf, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 4, 1977, Ser. No. 756,657
Int. Cl.[2] F23D 13/20, 11/44
U.S. Cl. 431—5 7 Claims

1. A process for the thermal after-burning of waste gases which contain combustible substances capable of forming an explosive mixture with air in a specific concentration range, which process comprises feeding the waste gas undiluted to a flame with a concentration of combustible substances which varies between the lower and the upper explosion limits, feeding the waste gas to the combustion zone at an entry speed higher than 10 m/sec, and discontinuing the supply of waste gas when a limit temperature of 80° C. is exceeded in the waste gas shortly before its entry into the combustion zone.

4. An after-burning plant for the thermal after-burning of waste gases which contain combustible substances capable of forming an explosive mixture with air in a specific concentration range, which comprises a combustion chamber having a burner and a feed pipe for fuel, which latter is preferably gaseous or liquid, a waste gas feed line for introducing waste gas of the above described kind into the combustion chamber, safety means for preventing the flame penetrating from the combustion chamber into the waste gas feed line, said safety means comprising (a) a dry detonation safety device which is provided in the waste gas feed line upstream of its entry into the combustion chamber, (b) a temperature control device

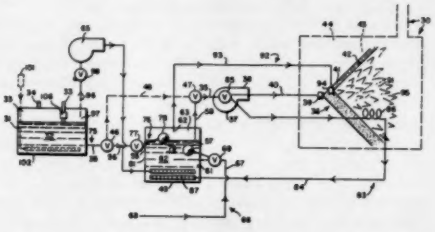


associated with said dry detonation safety device to control the temperature in said device and (c) at least one quick-acting gate valve which is built into the waste gas feed line upstream of the detonation safety device and which can be closed by delayed action by the temperature control device, and a flow rate meter connected to the waste gas feed line between the at least one quick-acting gate valve and the detonation safety device for controlling the supply of fresh air into the waste gas feed line upstream of the detonation safety device.

4,144,015
COMBUSTION PROCESS

Camille J. Berthiaume, Hampton Beach, N.H., assignor to Columbia Chase Corporation, Braintree, Mass.

Continuation-in-part of Ser. No. 612,109, Sep. 10, 1975, Pat. No. 4,008,038, and a continuation-in-part of Ser. No. 735,635, Oct. 26, 1976. This application Feb. 14, 1977, Ser. No. 768,610
Int. Cl.[2] F23C 5/00
U.S. Cl. 431—8 10 Claims



1. A process for suppressing nitrogen-oxide formation in burning of hydrocarbon fuel oil comprising the steps of emulsifying from 12% with 25% water with said fuel oil, burning said fuel oil in a combustion chamber in a flame at or above 3000° F. and wherein

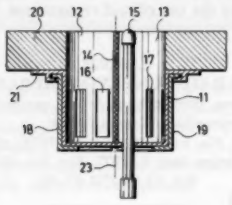
(i) said emulsifying of said hydrocarbon with a water is carried out with a gaseous dispersing fluid to form a fuel emulsion

(ii) and said emulsion is passed under a higher pressure to a burner head and thence into a furnace at a lower pressure, causing said dispersing fluid to expand and disperse said fuel emulsion.

4,144,016
BURNER

Yasuro Takahashi; Hisao Yamamoto; Masayasu Sakai, and Toshiyuki Takegawa, Nagasaki, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Feb. 9, 1977, Ser. No. 767,144
Claims priority, application Japan, Feb. 10, 1976, 51-12841
Int. Cl.² F23C 5/00
U.S. Cl. 431—8 **5 Claims**

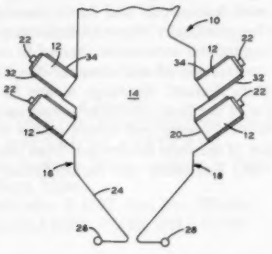


1. A burner comprising, in combination, a case having a central axis, a side wall, an outer end wall and an inner end opening into a furnace; partition means dividing the space enclosed by said side wall into plural sub-spaces opening into the furnace and each constituting an air nozzle having at least one air inlet port respective thereto; air velocity regulator means operatively associated with said nozzles to control the respective velocities of the air issuing therefrom, relative to the mean air velocity through the total air flow opening area of said nozzles, so that at least one nozzle has an air velocity higher than said mean air velocity and at least one other nozzle has an air velocity lower than said mean air velocity, with the flow opening area for the lower velocity air flow being from 30% to 60% of said total air flow opening area; and fuel nozzle means operatively associated with the at least one other nozzle having an air velocity lower than said mean air velocity; said air velocity regulator means controlling the air supply so that the amount of air supplied at low velocity is not more than 70% of the theoretical air required for combustion of the fuel delivered to the furnace by said fuel nozzle means.

4,144,017
PULVERIZED COAL COMBUSTOR

Joseph A. Barsin; David M. Marshall, and Edward A. Pirsh, all of Akron, Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Nov. 15, 1976, Ser. No. 741,902
Int. Cl.² F23L 9/00
U.S. Cl. 431—10 **7 Claims**



1. A method for inhibiting the formation of nitric oxides when burning pulverized coal, and including at least one primary furnace having inlet and outlet openings, a secondary furnace in receiving communication with the outlet opening, and comprising the steps of:

introducing combustion air and pulverized coal through the primary furnace inlet opening,

regulating the combustion air to introduce 50 to 70 percent of total stoichiometric air to the primary furnace, said combustion air including air for conveying the pulverized coal to the primary furnace,

maintaining the coal-conveying air at 15 to 30 percent of total stoichiometric air,

introducing combustion air to the secondary furnace,

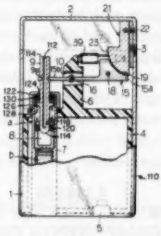
regulating the last named combustion air to introduce 50 to 70 percent of total stoichiometric air to the secondary furnace, and

controlling the first and second named regulating steps to maintain the total quantity of combustion air supplied to said primary and secondary furnaces in the range of 105 to 125 percent of total stoichiometric air.

4,144,018
CIGARETTE LIGHTER USING HYPERGOLIC FUEL COMPONENT

Noboru Tanaka, Tokyo, Japan, assignor to Tokyo Pipe Co. Ltd. and Dankyo Seisakusho Co., Ltd., both of Tokyo, Japan

Filed Aug. 29, 1977, Ser. No. 828,636
Claims priority, application Japan, Sep. 11, 1976, 51-109196; Sep. 14, 1976, 51-110424; Sep. 20, 1976, 51-112690
Int. Cl.² F23Q 2/16
U.S. Cl. 431—131 **7 Claims**



1. A cigarette lighter comprising:

(a) a case;

(b) an openable cap for said case;

(c) at least one fluid container in said case;

(d) said at least one fluid container containing a spontaneously ignitable substance which spontaneously ignites upon exposure to air;

(e) said at least one container containing a fuel which vaporizes at atmospheric pressure;

(f) constant quantity valve means for dispensing a fixed maximum quantity of at least said spontaneously ignitable substance when it is actuated;

(g) means for actuating said constant quantity valve means;

(h) said means for actuating requiring a physical act of the user;

(i) means for blocking operation of said means for actuating when said cap is closed, said means for blocking being further adapted to permit operation of said means for actuating when said cap is opened;

(j) at least one nozzle;

(k) valve means for controlling the supplying of said fuel to said at least one nozzle;

(l) means for exposing said spontaneously ignitable substance to the atmosphere in a location where it ignites said fuel at said nozzle;

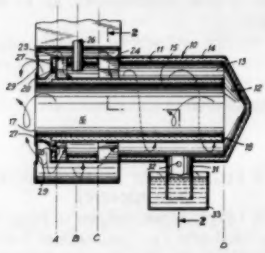
(m) said spontaneously ignitable substance and said fuel being mixed in said at least one container; and

(n) said constant quantity valve means dispensing a fixed maximum quantity of the mixture to said at least one nozzle.

4,144,019
VORTEX TYPE BURNER

Norman A. Lyshkow, Brooklyn, N.Y.; Herbert E. Beningson, Stamford, Conn., and Camillo V. Di Ruocco, Ossining, N.Y., assignors to Combustion Equipment Associates, Inc., New York, N.Y.

Filed Mar. 24, 1977, Ser. No. 780,940
Int. Cl.[2] F23C 5/08
U.S. Cl. 431—173 17 Claims

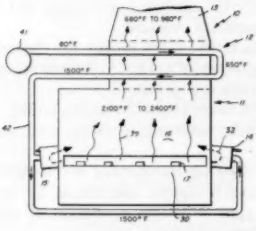


1. A burner comprising first horizontal means defining an inner chamber, second horizontal means defining an outer chamber surrounding said inner chamber, each of said chambers having an upstream end and a downstream end, said downstream end of said inner chamber including means defining an opening through which combustion gases exit from the burner, said downstream end of said outer chamber having a closed end wall, said upstream end of said inner chamber being spaced from said end wall, first fuel inlet means located proximate said upstream end of said outer chamber and first air inlet means located proximate said upstream end of said outer chamber.

4,144,020
ENERGY CONSERVING PROCESS FURNACE SYSTEM AND COMPONENTS THEREOF

Paul G. LaHaye; John W. Bjerklie, both of Cape Elizabeth, and Gerald G. Gallant, Jr., Gorham, all of Me., assignors to Hague International, So. Portland, Me.

Division of Ser. No. 547,381, Feb. 6, 1975, Pat. No. 4,029,465. This application May 12, 1977, Ser. No. 796,304
Int. Cl.[2] F27D 7/00
U.S. Cl. 432—19 8 Claims



1. A method of operating a slot furnace to conserve fuel needed to maintain the combustion area of the furnace at a desired process operating temperature,

said method comprising,

burning fluid fuel in said furnace in a burner by mixing said fuel with preheated combustion air,

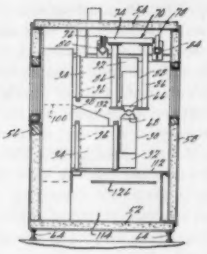
exhausting gas from said furnace through an exhaust stack and over the finned surface of a plurality of ceramic heat recuperator tubes mounted therein,

said combustion air being preheated to a temperature of at least 1300° F. by heat extracted from said exhaust gas in said stack by the use of said recuperator.

4,144,021
FLUID RAIL CONVEYING APPARATUS

John W. Neumann, Birmingham, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Division of Ser. No. 649,836, Jan. 16, 1976, abandoned. This application Aug. 8, 1977, Ser. No. 822,428
Int. Cl.[2] F27B 15/00
U.S. Cl. 432—58 5 Claims



1. An apparatus for conveying articles comprising a framework defining a longitudinally extending enclosure, a member extending longitudinally through said enclosure, means for supporting said member from said framework, said member defining a rail having a longitudinally extending supporting surface of a transverse configuration conforming substantially to the configuration of an article being conveyed and provided with a plurality of ports therein, means defining a plenum connected to said member and disposed in communication with the plurality of said ports in said rail, supply means for supplying a fluid under pressure to said plenum for discharge from said ports for supporting and conveying an article along said rail on a cushion of fluid in spaced relationship relative to said supporting surface, heating means in said supply means for heating said fluid to a preselected temperature, said means for supporting said member from said framework including guide means on said framework and coacting means on said member for permitting limited longitudinal movement of said member relative to said framework and for maintaining said rail in appropriate longitudinally aligned relationship and permitting restricted longitudinal movement thereof in response to elongation and contraction of said member due to fluctuations in the temperature thereof, discharge means for discharging at least a portion of the fluid discharged from said ports from the interior of said enclosure, and return means for recovering at least a portion of the fluid discharged from said ports from the interior of said enclosure for recirculation to said supply means.

4,144,022
FURNACE ROLLERS

Ronald S. Fusco, Mentor, Ohio, assignor to Amax Inc., Greenwich, Conn.

Filed Apr. 11, 1977, Ser. No. 786,076
Int. Cl.[2] F27D 3/00
U.S. Cl. 432—246 3 Claims

1. In a roller-hearth furnace for treating metals in reducing atmospheres, which furnace includes a heating chamber, rotatable shafts extending across the heating chamber, rollers mounted on the shaft, and means for rotating the shafts, the improvement which comprises rotatable metallic molybdenum shafts and metallic molybdenum rollers.

4,144,023
DYEING OF HIGH STRENGTH, HIGH MODULES AROMATIC POLYAMIDE FIBERS

Richard L. Provost, Midlothian, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 11, 1977, Ser. No. 843,079
Int. Cl.[2] D06P 3/24
U.S. Cl. 8—17 6 Claims

1. An improved process for dyeing high strength, high modulus aromatic polyamide fibers comprising the steps of (1) wetting the dry fibers to contain at least 15% by weight moisture, (2) crimping the fibers while wet to at least 10 crimps per inch (3.9/cm.), (3) maintaining the crimped fibers so that they contain at least 15% by weight moisture based on the dry fibers at all times before dyeing and (4) dyeing the fibers.

4,144,024
REDUCED-STAINING COLORANT SYSTEM

Robert J. Lala, River Edge, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Feb. 21, 1978, Ser. No. 879,172
The portion of the term of this patent subsequent to May 25, 1993, has been disclaimed.
Int. Cl.[2] C09B 1/28, 1/32; C11D 3/40, 3/42
U.S. Cl. 8—25 1 Claim

1. A dyestuff composition for enhancing the nonstaining characteristics of liquid synthetic detergents consisting essentially of about 0.0005% by weight to about 0.0030% by weight of 1,4-bis(2-ethylhexylamino) anthraquinone and at least one soluble dye selected from the group consisting of about 0.005% by weight to about 0.025% by weight of 1-amino-2-sulfo, 4-(2-sulfo-para toluidino) anthraquinone sodium salt, 0.005% by weight to about 0.025% by weight of 1,4-bis(3-sodium sulfonate-mesitylidino) anthraquinone and mixtures thereof.

4,144,025
PROCESS FOR MAKING DISPERSIONS COMPRISING SPHERICAL PARTICLES

Thomas F. Swank, Sudbury, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 2, 1977, Ser. No. 793,063
Int. Cl.[2] C09B 67/00; B01J 13/00
U.S. Cl. 8—79 6 Claims

1. In a process for preparing an aqueous dispersion of spherical particles of an organic material which is substantially insoluble in water and is soluble in an organic solvent which is more volatile than and miscible with water, which comprises:

making a solution of said material in an organic solvent which is more volatile than and miscible with water;

mixing said solution of material with an aqueous solution of a dispersant for precipitated particles whereby particles having a substantially spherical crystal habit are rapidly formed; and

quickly removing said organic solvent by vaporization whereby a dispersion of spherical particles of said organic material is obtained;

the improvement wherein said solution with said organic solvent additionally includes at least ten percent by weight water, but less water than would cause precipitation of said organic material from solution prior to said mixing.

2. The process of claim 1 wherein said organic material is a dye.

4,144,026
PROCESS FOR SIMULTANEOUSLY PROVIDING SYNTHETIC TEXTILE MATERIALS WITH AN ANTISTATIC AND DIRT-REPELLENT FINISH

Rudolf Keller, Riehen, and Rosemarie Töpfl, Dornach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 24, 1977, Ser. No. 809,590
Claims priority, application Switzerland, Jul. 6, 1976, 8627/76
Int. Cl.[2] D06M 13/00
U.S. Cl. 8—115.6 24 Claims

1. A process for simultaneously providing a synthetic textile with an antistatic and dirt-repellent finish, comprising the steps of treating said textile with an aqueous preparation which consists essentially of

(a) 0.3 to 1.5% by weight of a copolymer of an α,β-unsaturated dicarboxylic acid or the anhydride thereof and at least one other ethylenically unsaturated compound, and

(b) 0.1 to 1% by weight of a fatty acid/alkanolamine reaction product or an alkylene oxide adduct of this reaction product,

and subsequently drying the textile.

4,144,027
PRODUCT AND PROCESS

Emile E. Habib, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 269,897, Jul. 7, 1972, abandoned, which is a continuation of Ser. No. 292,776, Jul. 3, 1963, abandoned, which is a continuation-in-part of Ser. No. 230,710, Oct. 15, 1962, abandoned. This application Aug. 22, 1977, Ser. No. 826,771
Int. Cl.[2] D06M 13/18, 13/42
U.S. Cl. 8—127.6 23 Claims

1. A process for shrinkproofing a textile fabric containing keratin fibers which comprises impregnating said fabric with a isocyanate/polyether polyol composition containing a co-reactant having at least two groups containing at least one active hydrogen and combination thereof selected from the group consisting of —OH, —NH_2, —COOH, and —SH to provide a solids pickup of up to about 10% by weight, drying the treated fabric to remove substantially all of the liquid, and curing said treated fabric at a temperature sufficient to effect a reaction between the keratin fibers and the isocyanate/-polyether polyol components of said composition; said isocyanate/polyether polyol composition being an aqueous or a non-isocyanate-reactive organic solvent composition containing a mixture of a isocyanate which is activated by heating at an elevated temperature and a polyether polyol, other than a polyol based on a natural occurring polymer, said isocyanate being blocked only when said composition is an aqueous composition.

4,144,028
TINT COMPOSITIONS FOR NYLON HAVING IMPROVED FUGITIVITY PROPERTIES

Peter J. Hauser, Inman, S.C.; James E. Hendrix, La Grange, Ga., and Hans H. Kuhn, Spartanburg, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Sep. 3, 1976, Ser. No. 720,220
Int. Cl.[2] D06P *3/00, 5/08*
U.S. Cl. 8—164 **5 Claims**

1. Fugitive tint compositions for amorphus, undrawn nylon or fully drawn cationic dyeable nylon comprising an admixture of a colorant having the formula

$$R-\left\langle -N-[(CH_2CH_2O)_nH]_2\right\rangle_x$$

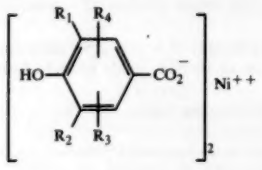
wherein R is an organic dyestuff radical, x is an integer of 1 to 6, and the product of 2n times x is from about 200 to 300, and a minor effective amount of a free radical inhibitor.

4,144,029
NICKEL STABILIZERS AND DYE ENHANCERS FOR POLYOLEFINS

Joseph A. Hoffman, Bridgewater, and Robert J. Tucker, Hackettstown, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 29, 1977, Ser. No. 820,264
Int. Cl.[2] C07C *5/02, 65/04;* **C08K** *5/52;* **C09B** *67/00*
U.S. Cl. 8—180 **20 Claims**

1. A nickel stabilizer composition for rendering polyolefins dyeable, and resistant to degradation by heat and ultraviolet radiation, comprising a product of the reaction of about 30 to 90 parts by weight of a compound of formula (I)



(I)

wherein R_1 and R_2 are each alkyl radicals having up to 8 carbon atoms at least one of which is branched on the alpha carbon, and R_3 and R_4 are each hydrogen or an alkyl radical having up to 18 carbon atoms, and about 70 to 10 parts by weight, respectively, of a secondary or tertiary organic phosphite.

4,144,030
METHOD FOR IMPROVING THE RATE AND MEASUREMENT ACCURACY OF CHEMICAL ANALYSIS

Osmo Suovaniemi, Armas Lindgrenintie 15 A, 00570 Helsinki 57, Finland

Filed Aug. 3, 1977, Ser. No. 821,501
Claims priority, application Finland, Aug. 4, 1976, 762239
Int. Cl.[2] G01N *21/24, 5/00*
U.S. Cl. 23—230 R **4 Claims**

1. A method of improving the measuring accuracy in the chemical analyses of solutions containing substances to be measured using a single or a multi-channel optical measuring device together with gravimetric measurements of said solutions which comprises:

providing at least one of said solutions to be measured confined in a closed space to minimize evaporation thereof,

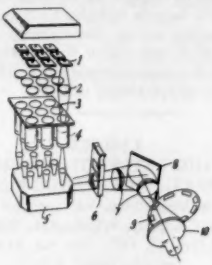
removing a volumetric portion of said solution to be analyzed from said confined space and inserting said volumetric portion into a vertically disposed cuvette for optical analysis,

the weight of said volumetric portion being determined and stored for use in calculating the analysis of said solution,

determining optical absorption data of said solution by passing a light beam along the longitudinal vertical axis of said cuvette through the total volumetric portion of said solution from one end of said cuvette vertically to its other end having a predetermined cross-section area and then to a detector,

said light beam after passing vertically through said total volumetric portion of said solution being then measured for the amount of absorption by said detector,

and then determining the analysis of said solution from said absorption data and said weight measurement by feeding said optical data and the weight measurement to a computer, the analysis in the desired units being determined by said computer in accordance with the equation $A = \epsilon \cdot l \cdot c$; where



A = absorbance ($\log Io/I$;

ϵ = molar absorptivity;

l = length of light path passing longitudinally through the solution in the cuvette; and

c = the concentration of the absorbing substance;

wherein $c = m/V$ and $l = V/a$

in which

m = mass of absorbing substance;

v = the volume of the solution in the cuvette; and

a = the cross-section area of the other end of said cuvette.

4,144,031
CELL TEST FOR DETECTING HUMAN CHORIONIC GONADOTROPIN

Hernan F. Acevedo, Allison Park; Malcolm Slifkin, Pittsburgh, and Milton H. Dalbow, Springdale, all of Pa., assignors to International Radioimmune Systems, Inc., Brighton, Mich.

Filed Apr. 19, 1976, Ser. No. 677,992
Int. Cl.[2] G01N *33/16*
U.S. Cl. 23—230 B **6 Claims**

1. A diagnostic cell test for detecting human chorionic gonadotropin as evidence of cancer, comprising the steps of:

(a) treating the cells to be tested with the specific antiserum to the beta-subunit of human chorionic ganadotropin, the antiserum having been raised in a host animal;

(b) treating one portion of said cells with the antiserum to the gamma globulin of said host animal conjugated to fluorescein;

(c) examining said one portion of cells under an utlra-violet light microscope for fluorescence; if fluorescence is found, the indirect fluorescein labeled antibody test is considered positive; if not, the indirect test is negative;

(d) treating a second portion of cells with the antiserum to the gamma globulin of said host animal conjugated to peroxidase;

(e) activating said peroxidase and then examining said second portion of said cells under a microscope for staining with peroxidase; if staining is found, the indirect peroxidase-labeled antibody test is considered positive; if not, the indirect test is negative;

(f) if one indirect labeled antibody test is negative and the other indirect test is positive, repeat the indirect tests; and

(g) analyzing the tests as follows; the diagnostic cell test for human chorionic gonadotropin is considered positive if both indirect labeled antibody tests are positive; if both indirect tests are negative or if one indirect test is positive and the other is negative, the cell test is considered negative, establishing that cancer is not present in the cells tested.

4,144,032

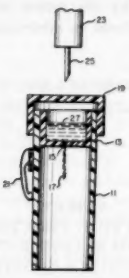
PERSONAL DOSIMETER AND METHOD OF USE

Frank R. Davis, Jr., 12 S. Mountain Ave., Montclair, N.J. 07042

Filed Aug. 24, 1977, Ser. No. 827,349

Int. Cl.² G01N *31/06*

U.S. Cl. 23—232 R **15 Claims**



1. An improved personal dosimeter comprising:

(a) an elongated plastic tube open on both ends;

(b) a well formed at one end of said tube;

(c) a wick extending into said well from the other end of said tube; and

(d) a cover over said one end of said tube containing said well whereby a solution which adsorbs, absorbs or reacts with a toxic gas in the air may be placed in said well when it is desired to use the said dosimeter and will wick from said well into said wick, the other end of said tube being open to the ambient air and permitting a transfer thereof to said wick.

4,144,033

PROCESS FOR MANUFACTURING METALLURGICAL CABONACEOUS MATERIALS FROM COALS

Yukio Nakako, and Shizuo Yokota, both of Nishinomiya, Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Sep. 20, 1977, Ser. No. 835,412

Claims priority, application Japan, Sep. 20, 1976, 51-112676; Sep. 20, 1976, 51-112677

Int. Cl.² C10L *9/00*; C10B *57/12*; C10G *1/06*

U.S. Cl. 44—1 F **24 Claims**

1. A process for manufacturing solid metallurgical carbonaceous material having an atomic content ratio of oxygen to carbon of less than 0.05 and an atomic content ratio of hydrogen to carbon ranging from 0.5 to 1 from coals, comprising the steps of:

mixing coal fines with a hydrocarbon solvent having a boiling point of 150° to 500° C. to prepare a slurry;

subjecting said slurry to a first reduction-decomposition heat treatment, wherein said slurry is treated at a temperature of 300° to 600° C. and a pressure of 50 to 300 atms, in the presence of a mixture gas containing carbon monoxide and steam; and

subjecting the reaction product of obtained from said first heat treatment to a second decomposition-reforming heat treatment, wherein said reaction product is treated at a temperature of 420° to 470° C. and a pressure of 10 mmHg to 250 atms in the presence of hydrogen of a low partial pressure.

10. A process as defined in claim **1**, wherein the weight ratio, of said solvent to said coals ranges from 1 to 4.

21. The metallurgical carbonaceous material produced by the process of claim **1**.

4,144,034

POLYETHER-MALEIC ANHYDRIDE REACTION PRODUCT CONTAINING MOTOR FUEL COMPOSITION

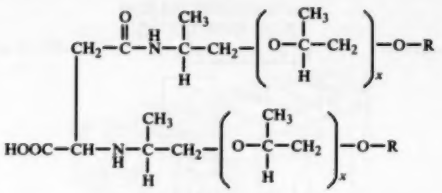
William M. Cummings, Fishkill, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,104

Int. Cl.² C10L *1/22*

U.S. Cl. 44—71 **6 Claims**

1. A motor fuel composition comprising a mixture of hydrocarbons in the gasoline boiling range containing from about 0.0002 to 0.2 weight percent of a polyether amine-maleic anhydride reaction product represented by the formula:



in which R represents an aliphatic hydrocarbon radical having from 6 to 20 carbon atoms and x is a integer from 1 to 3.

4,144,035

DETERGENT AND CORROSION INHIBITED MOTOR FUEL COMPOSITION

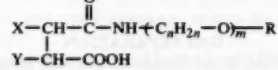
Philip H. Moss, and Ernest L. Yeakey, both of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,105

Int. Cl.² C10L *1/22*

U.S. Cl. 44—71 **6 Claims**

1. A motor fuel composition comprising a mixture of hydrocarbons in the gasoline boiling range and from about 0.0002 to 0.2 weight percent of an aliphatic hydrocarbon-polyether substituted succinamic acid represented by the formula:



in which R is an aliphatic hydrocarbon radical having from about 8 to 22 carbon atoms, X and Y alternatively represent hydrogen and an aliphatic hydrocarbon radical having from 6 to 16 carbon atoms, n is an integer from 3 to 4 and m is an integer from 2 to 5.

4,144,036

DETERGENT FUEL COMPOSITION

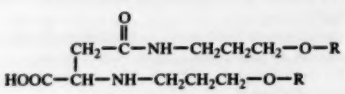
William M. Cummings, Fishkill, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,106

Int. Cl.² C10L *1/22*

U.S. Cl. 44—71 **6 Claims**

1. A motor fuel composition comprising a mixture of hydrocarbons in the gasoline boiling range containing from about 0.0002 to 0.2 weight percent of a polyether reaction product of an asparagine represented by the formula:



in which R represents an aliphatic hydrocarbon radical having from about 10 to 20 carbon atoms.

4,144,037

GAS SEPARATION

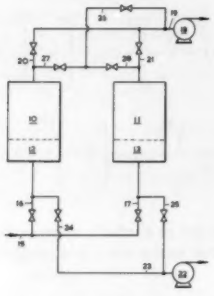
John W. Armond, Great Bookham, and Martyn S. Ray, Hednesford, both of England, assignors to Boc Limited, London, England

Filed Feb. 25, 1977, Ser. No. 772,214

Claims priority, application United Kingdom, Feb. 27, 1976, 7894/76

Int. Cl.[2] B01D *53/04*

U.S. Cl. 55—58 **14 Claims**



1. In a process for increasing the proportion of a selected component in a gaseous mixture wherein the process employs an absorbent bed which preferentially adsorbs one or more other components of the mixture, the bed having an inlet for the gaseous mixture at one end and an outlet for product gas at its opposite end, the improvement comprising repeating a cycle of operation which includes the successive steps of: allowing the gaseous mixture in a substantially unpressurized condition to be drawn into the bed through said inlet while simultaneously withdrawing an unadsorbed product gas from the bed through said outlet, and regenerating the bed by the action of a reduced pressure applied to said inlet without an intervening purge step at least at atmospheric pressure.

4,144,038

GAS SEPARATION

John W. Armond, Great Bookham, England, assignor to BOC Limited, London, England

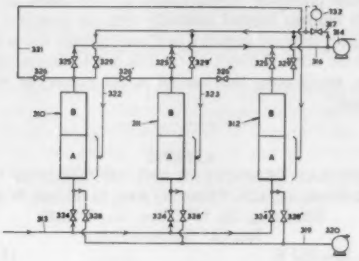
Filed Feb. 25, 1977, Ser. No. 772,240

Claims priority, application United Kingdom, Dec. 20, 1976, 53063/76

Int. Cl.[2] B01D *53/04*

U.S. Cl. 55—58 **8 Claims**

1. In a process for increasing the proportion of a selected component in a gaseous mixture which includes at least two other components, wherein the process employs a first adsorbent bed which preferentially adsorbs at least one of the other components and a second adsorbent bed which preferentially adsorbs at least another of the other components, the beds being connected together in series and having an inlet for the gaseous mixture at one end of the series of beds and an outlet for product gas at the opposite end of the series of beds, the improvement comprising repeating a cycle of operation which includes the successive steps of: allowing the gaseous mixture in a substantially unpressurized condition to be drawn into the beds through said inlet while simultaneously withdrawing an unadsorbed product gas from the beds through said outlet by the action of a reduced pressure applied to said outlet, and



regenerating the beds by the action of a reduced pressure applied to said inlet without an intervening purge step.

4,144,039

SELECTIVE ABSORPTION PROCESS OF HYDROGEN SULPHIDE AND SULPHUR CONTAINING COMPOUNDS FROM A GASEOUS MIXTURE

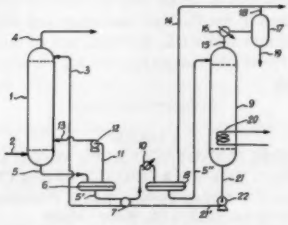
Claude Blanc; Jean-Yves Chenard, both of Pau, and Olivier Oliveau, Lescar, all of France, assignors to Societe Nationale Elf Aquitaine (Production), Paris, France

Filed Jan. 5, 1978, Ser. No. 867,291

Claims priority, application France, Jan. 6, 1977, 77 00274

Int. Cl.[2] B01D *19/00*

U.S. Cl. 55—73 **9 Claims**



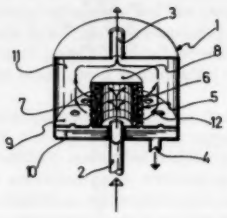
1. A process for the selective desulphuration of a gaseous mixture comprising, in addition to hydrogen sulphide, carbon dioxide and at least one compound from the groups comprising hydrogen, carbon dioxide, hydrocarbons, nitrogen, oxygen and steam and which comprises washing the said gases with a pure solvent or with a solvent mixed with water in an absorption column maintained at a pressure higher than the atmospheric pressure and at a temperature between 5° and 80° C., said solvent is selected from the group consisting of thioethers, thioamides and alkyl thiocarbonates which are liquid at room temperature and present a viscosity at 40° C. lower than 10 centipoises and a vapor pressure lower than 0.25/n torr, wherein n represents the number of sulphur atoms in the solvent molecule, and which lead to a weight ratio of absorbed H_2S to absorbed CO_2 higher than 5 at a temperature of 40° C., the H_2S by weight absorbed being at least equal at said temperature to one part by weight for 100 parts by weight of solvent per bar of H_2S partial pressure, while the CH_4 absorbed is lower than 1.0 part by weight for 1000 parts by weight of solvent per bar of CH_4 partial pressure.

4,144,040

METHOD AND APPARATUS FOR DEMISTING GASES

Jozef Claes, Balen, and Roger De Bruyne, Zulte, both of Belgium, assignors to N.V. Bekaert S.A., Zwevegem, Belgium

Filed Sep. 13, 1976, Ser. No. 722,614
Claims priority, application Belgium, Sep. 12, 1975, 159966
Int. Cl.² B01D *46/00*
U.S. Cl. 55—97 **21 Claims**



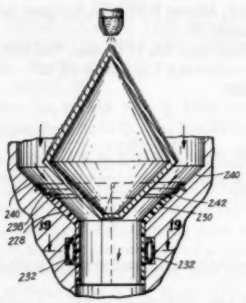
11. A method for filtering a stream of gas at high efficiency for removing liquid particles at least some of which are of submicron dimensions therefrom comprising passing the stream of gas at a velocity of less than 70 cm/sec through a filter material comprising a plurality of adjacent non-woven metal fiber webs moistenable by said liquid particles, the diameter of the fibres in successive webs decreasing in the direction of flow of the gas stream and the webs having a porosity of at least 0.985 whereby at least some of said particles including at least some of said submicron particles are removed from the gas stream, and removing captured liquid from the filter material.

4,144,041

ADJUSTABLE THROAT VENTURI SCRUBBER

Karl L. Hou, 29 E. Maple St., Teaneck, N.J. 07666

Filed Nov. 3, 1977, Ser. No. 848,233
Int. Cl.² B01D *47/10*
U.S. Cl. 55—226 **26 Claims**



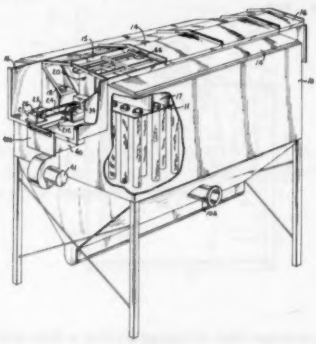
1. An adjustable throat venturi scrubber for the scrubbing of a gas stream with a liquid which comprises a venturi scrubber having an approach section and a throat section, said approach section being a converging gas passage which terminates at and is connected to said throat section, said throat section being a gas passage having a restricted cross-sectional area, means to pass an inlet gas stream successively through said approach section and said throat section, whereby said gas stream is accelerated to a high velocity in said throat section, means to project a scrubbing liquid stream into said gas stream at or adjacent to said throat section, whereby said scrubbing liquid stream is comminuted into a plurality of discrete small liquid droplets within said gas stream and said gas stream is thereby scrubbed, said throat section extending to means to separate the resulting gas-liquid mixture into a scrubbed gas phase and a scrubbing liquid phase containing a component removed from said inlet gas stream, and means to adjust the cross-sectional dimension of the gas passage at or adjacent to said throat section, said adjustment means comprising at least one movable baffle at the periphery of said gas passage and a container, said container being composed of a flexible and resilient material, said container being external to and contiguous with said baffle, together with means to pass a controlled amount of a fluid into said container whereby the internal fluid pressure within the container and resultant volumetric dimension of said container, and resultant displacement of said baffle relative to the periphery of said throat section, are adjustable in proportion to a change in the flow rate of said inlet gas stream.

4,144,042

BAGHOUSE WITH DOUBLE PASS TRAVELING PURGE HEAD

Richard D. Noland, 1900 W. 47th Pl., Ste. 308, Shawnee Mission, Kans. 66205

Continuation-in-part of Ser. No. 806,188, Jun. 13, 1977, Pat. No. 4,097,254. This application May 5, 1978, Ser. No. 903,085
The portion of the term of this patent subsequent to Jun. 27, 1995, has been disclaimed.
Int. Cl.² B01D *46/06*
U.S. Cl. 55—287 **8 Claims**



1. Apparatus for separating particulate matter from a gas stream, said apparatus comprising:

a housing;

a substantially horizontal partition disposed interiorally of said housing, thereby defining a first chamber above said partition and a second chamber beneath said partition, said partition having a plurality of openings therethrough;

an inlet conduit connected to said second chamber for directing a particulate laden gas stream into said second chamber;

an outlet conduit communicating with said first chamber to exhaust gas therefrom;

a plurality of filters disposed in said second chamber and having open ends secured to said openings through said partition, said filters being arranged in two parallel, spaced apart banks;

a plurality of vertical dividers arranged in said first chamber above said two banks of filters to thereby define compartments having mouths opening centrally of said first chamber;

a movable cleaning head disposed within said first chamber between said banks of filters and having an air delivery conduit adapted to matingly register with and seal against said compartment mouths;

drive means coupled to said cleaning head to move said head longitudinally forward and backward within said first chamber between said banks of filters;

pressurized air supply means connected to said cleaning head to supply pressurized cleaning air thereto;

valve means mounted on said cleaning head to normally restrict flow of cleaning air from said delivery conduit and intermittently operable to transmit to burst of cleaning air through said delivery conduit; and

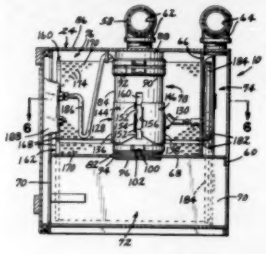
valve discharge control means positioned and arranged with respect to said valve means to cause said valve means to transmit a burst of cleaning air through said delivery conduit each time said delivery conduit aligns with a compartment mouth of one bank of filters as said cleaning head travels through said first chamber in one direction and to cause said valve means to transmit a burst of cleaning air through said delivery conduit each time said delivery conduit aligns with a compartment mouth of the second bank of filters as said cleaning head travels through said first chamber in the opposite direction.

4,144,043

THREE-STAGE DUST COLLECTOR

Gordon L. Johnston, Maple Grove, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Filed Jun. 13, 1977, Ser. No. 805,986
Int. Cl.[2] B01D 50/00; E21C 7/00
U.S. Cl. 55—319 **15 Claims**



1. A three-stage dust collector having a first dust separator and a third dust separator, a second dust separator connected in fluid communication between said first and third dust separators, said second dust separator formed of a block of material having an inlet end and an outlet end spaced apart along a longitudinal axis, a continuous side wall between said inlet and said outlet ends, said side wall having a plurality of side outlet apertures disposed intermediate said inlet and said outlet ends, said second separator having a plurality of passageways between said inlet end and said outlet ends thereof, said passageways having axes aligned generally parallel to said longitudinal axis, said passageways being disposed within said block of material so that said block of material surrounding and defining said axial passageway is relatively thick measured in a direction generally radially with respect to said axes of said axial passageways and as compared to the inside diameter of said axial passageways, said second dust separator further comprising:

(a) vortex generating means affixed within each of said axial passageways at said inlet ends thereof whereby a circular flow component is imparted to the axial flow of dust-laden air such that dust particles are centrifugally thrown toward the surface of said axial passageway to exit through said outlet end of said separator; and

(b) means disposed within said second separator for channeling substantially clean air from each axial passageway through one of said side outlet apertures, said second dust separator connected to said third dust separator so that said substantially clean air is directed from said second to said third dust separator.

4,144,044

METHOD AND APPARATUS FOR FORMING FIBERS

Robert G. Russell, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 18, 1977, Ser. No. 853,002
Int. Cl.[2] C03B 37/02
U.S. Cl. 65—2 **27 Claims**

1. The method of forming a glass filament comprising: supplying a stream of glass; positioning a movable member at the zone of attenuation within such stream; attenuating the stream to a filament; and moving the member sufficient to texture said filament.

2. The method of claim 1 wherein the member is rotated to form a twisted filament.

4,144,045

KILN AND METHOD FOR HEATING AND BENDING GLASS SHEETS

Eugene W. Starr, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 13, 1978, Ser. No. 895,909
Int. Cl.[2] C03B 23/02
U.S. Cl. 65—107 **9 Claims**

1. Apparatus for bending and annealing glass sheets comprising

an enclosed kiln comprising a floor, a roof, a front wall, a rear wall and two side walls of refractory material,

a source of hot gas exterior to said kiln,

gas delivery means for delivering gas from said source to within said kiln under pressure,

said gas delivery means comprising an insulated delivery pipe communicating from said source and extending through said rear wall,

an interior delivery pipe within said kiln communicating at one end with said insulated delivery pipe,

a T-connection communicating with the other end of said interior delivery pipe,

a pair of branch pipes, one of said pair extending transversely in one direction from said T-connection and the other of said pair extending transversely in a direction opposite said one direction from said T-connection,

a manifold connected to the end of each of said branch pipes

and extending substantially the entire length of said enclosed kiln,

means to support each manifold adjacent said floor,

one of said manifolds being located adjacent one of said side walls and the other of said manifolds being located adjacent the other of said side walls,

each of said manifolds comprising an inner pipe and an outer pipe supported in approximately concentric relation, the inner pipe having open ends and the outer pipe having closed ends, the inner pipe communicating with an end of one of said branch pipes at one end thereof and communicating with the outer pipe of said manifold at the other end thereof, and

a plurality of nozzles extending upward from each of said outer pipes to provide a system for supplying gas at a substantially uniform controlled temperature within said kiln through restricted paths comprising said delivery pipe, said T-connection, said branch pipes, said inner pipes and said outer pipes through said nozzles into the interior of said chamber.

7. A method of controlling the temperature pattern within a kiln for thermally treating glass sheets having an end wall and a pair of opposite side walls comprising supplying a flow of a gaseous mixture containing combustion products at a higher temperature than the initial temperature within the kiln from a source of said gaseous mixture located outside said kiln along a restricted passage of flow through the transverse central portion of said end wall of said kiln, dividing said flow into two approximately equal, diverging, restricted flows toward said opposite side walls of said kiln, turning each of said diverging flows into parallel restricted flows extending parallel to and adjacent the bottom portions of said opposite side walls along substantially the entire length of said side walls, reversing the direction of said restricted flows near the end of said side walls, releasing said gaseous flows from said reversed restricted flows into said kiln, and continuing to supply said flow until a glass sheet mounted on a mold within said kiln has sagged into conformity with a shaping surface on said mold.

4,144,046

METHOD OF STIMULATING THE FLOW OF LATEX AND COMPOSITIONS USED THEREIN

James E. Esposito, Ft. Washington, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Continuation of Ser. No. 86,342, Nov. 2, 1970, abandoned. This application Jun. 9, 1975, Ser. No. 585,208

Int. Cl.[2] A01N *9/36*

U.S. Cl. 71—86 **14 Claims**

1. A composition having significant shelf life under tropical conditions comprising an aqueous medium containing an effective amount of 2-chloroethylphosphonic acid, a polysaccharide gum produced by the fermentation of a carbohydrate by the bacterium Xanthomonas Campestris, said gum being present in an amount of from about 0.5 to about 2.5% by weight of the total composition; and said composition having a viscosity of at least 1,000 cps.

4,144,047

3-ARYL-4-ISOXAZOLECARBOXYLIC ACIDS AS PLANT GROWTH REGULANTS

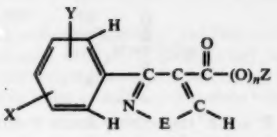
John E. Franz, Crestwood, and Robert K. Howe, Bridgeton, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 16, 1977, Ser. No. 852,165

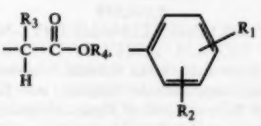
Int. Cl.[2] A01N *9/12, 9/22*

U.S. Cl. 71—90 **9 Claims**

1. A method for regulating the growth of leguminous plants which comprises applying to the plant system a plant growth regulating effective amount of a compound having the formula



wherein E is oxygen or sulfur; X and Y are independently selected from the group consisting of hydrogen, alkyl having up to five carbon atoms inclusive, alkoxy having up to five carbon atoms inclusive, trifluoromethyl, halogen, cyano and nitro; *n* is zero or one provided that when *n* is zero, Z is selected from the group consisting of chloro and NR_1R_2 wherein R_1 and R_2 are independently selected from the group consisting of hydrogen and alkyl having up to five carbon atoms inclusive; when *n* is one, Z is selected from the group consisting of hydrogen, alkyl having up to 12 carbon atoms inclusive, haloalkyl having up to five carbon atoms inclusive, benzyl, alkoxyalkyl wherein said alkoxy may have up to five carbon atoms inclusive and said alkyl may have up to five carbon atoms inclusive, allyl, monochlorinated allyl, dichlorinated allyl,



and agriculturally acceptable cations; wherein R_1 and R_2 are as previously defined, R_3 is hydrogen or methyl and R_4 is alkyl having up to five carbon atoms inclusive.

4,144,048

HERBICIDAL COMPOSITIONS

Adolf Fischer, deceased, late of Mutterstadt, Fed. Rep. of Germany (by Caecilia Emma Fischer, heiress-at-law), assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 627,965, Nov. 3, 1975, Pat. No. 4,057,414. This application Aug. 25, 1977, Ser. No. 827,583

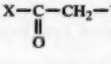
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1974, 2454576

Int. Cl.[2] A01N *9/22*

U.S. Cl. 71—92 **7 Claims**

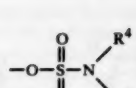
1. A herbicide composition comprising an inert carrier having dispersed therein a herbicidally effective amount of a mixture consisting essentially of

(a) a glycolic acid amide of the formula



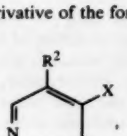
where X denotes

the carbonamide nitrogen being a ring member of a monocyclic or bicyclic cycloalkylimine of 7 to 9 ring members, which ring may be substituted by halogen or alkyl, and Y denotes



wherein R^4 and R^5 respectively denote hydrogen or lower alkyl, and

(b) a pyridazone derivative of the formula



where X denotes chloro, bromo, iodo or methoxy, R^1 denotes phenyl which may be substituted by methyl, trifluoromethyl or halogen and R^2 denotes amino, methoxy, α-hydroxy-β,β,β-trichloroethylamino

in a weight ratio of a to b of 5:1 to 1:5.

4,144,049

N-(4-BENZYLOXYPHENYL)-N-METHYL-N-METHOXYUREA

Ryo Yoshida, Kawanishi; Seizo Sumida, Nishinomiya; Eiyoshi Itooka, Takarazuka; Hiroshi Noguchi, and Katsuzo Kamoshita, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

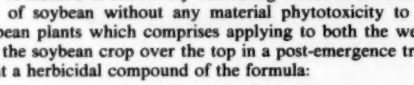
Filed Mar. 2, 1977, Ser. No. 773,784

Claims priority, application Japan, Mar. 16, 1976, 51-28999

Int. Cl.[2] A01N *9/20*

U.S. Cl. 71—120 **4 Claims**

1. A method of selectively combating weeds in the cultivation of soybean without any material phytotoxicity to the soybean plants which comprises applying to both the weeds and the soybean crop over the top in a post-emergence treatment a herbicidal compound of the formula:



in a dosage rate of about 2 to about 80 grams per are.

4,144,050

MICRO GRANULES FOR PESTICIDES AND PROCESS FOR THEIR MANUFACTURE

Heinz Frensch; Konrad Albrecht, and Klaus Hook, all of Frankfurt am Main, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 547,582, Feb. 6, 1975, abandoned, which is a continuation of Ser. No. 8,095, Feb. 2, 1970, abandoned. This application Mar. 21, 1977, Ser. No. 779,539

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1969, 1905524

Int. Cl.[2] A01N *9/20, 9/00, 9/12;* **A61K** *31/74*

U.S. Cl. 71—120 **2 Claims**

1. A process for the manufacture of a microgranular pesticide composition which comprises preparing a suspension of 2 to 80% by weight of a solid, particulate pesticidally active compound with (i) inert substance selected from the group consisting of diatomacious earth, silicic acids, kaolinite, alumina, chalk, bentonites, atta-clay, inorganic salts, milk powder and starch, (ii) wetting and dispersing agent in an amount of between 10% and 20% by weight, selected from the group consisting of sodium salt of lignine-sulfonic acid, ammonium salt of lignine-sulfonic acid, sodium salt of dinaphthylmethanedisulfonic acid, sodium salt of butylnaphthalene-sulfonic acid, oleylmethyl tauride sodium, sodium salt of alkyphenylsulfonic acid, condensation products of fatty acids, and albumin, and (iii) adhesion-promoting agent in an amount of between 0.5 to 10% by weight selected from the group consisting of polyvinyl acetate, polyvinyl acetate copolymers, partially hydrolyzed polyvinyl alcohols, carboxymethyl cellulose, vegetable rubbers, and glues, the total of said ingredients being 40 to 70 parts by weight in 30 to 60 parts by weight of water, wet grinding said suspension to a pesticide particle size no greater than 0.01 mm and thereafter spray drying the wet suspension in a spray drying apparatus at a drying gas inlet temperature of from 140° to 300° C. and a drying gas outlet temperature of 50° to 120° C. by means of a rotating disc at a circumferential disc speed of 80 to 100 m/sec. or using a single feed spray nozzle at a spraying pressure of from 5 to 8 atmospheres gauge or a double feed spray nozzle under a spraying pressure of 0.5 to 4 atmospheres gauge, to produce a microgranular pesticidal composition largely composed of particles having a size of 0.075 to 0.4 mm.

4,144,051

PROCESS FOR THERMALLY TREATING SOLIDS WITH HIGH-OXYGEN GASES, ESPECIALLY FOR PYROMETALLURGICAL APPLICATIONS

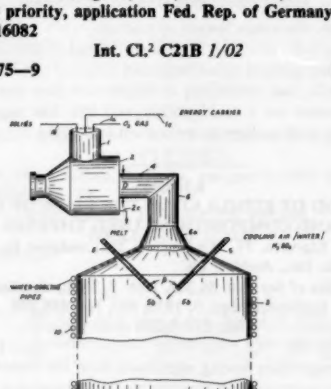
Martin Rahn, Frankfurt am Main; Lothar Reh, Bergen-Enkheim; Bernd Thone, Friedberg, and Karel Vydra, Bad Nauheim, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main and Deutsche Babcock Aktiengesellschaft, Oberhausen, both of, Fed. Rep. of Germany

Filed Aug. 11, 1977, Ser. No. 823,856

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1977, 2716082

Int. Cl.[2] C21B *1/02*

U.S. Cl. 75—9 **14 Claims**



1. A process for thermally treating particulate solids with a high-oxygen gas, comprising the steps of:

reacting said particulate solids with said gas at least in part in a cyclone chamber have a substantially horizontal axis and an outlet in an end wall thereof;

recovering a molten product from said cyclone through an opening in the lower portion of the shell and discharging gas entraining a minor portion of said molten product through said outlet;

introducing said gas into a cooling chamber; and

cooling said gas in said cooling chamber to a temperature below the solidification temperature of said droplet, the velocity of the gas entering said cooling chamber and the dimensions of said cooling chamber being selected to

ensure complete solidification of at least the surface of said droplets in free flight before contact of said droplets with a wall of said cooling chamber, said cooling chamber having a length L which is between $3 \times \sqrt{F}$ and $10 \times \sqrt{F}$ wherein F is the cross-sectional area of said cooling chamber.

4,144,052

PROCESS OF DIRECTLY REDUCING IRON-CONTAINING OXIDIC MATERIALS

Harry Serbent, Hanau, and Wolfram Schnabel, Hattersheim, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 25, 1977, Ser. No. 844,853

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1976, 2653512

Int. Cl.² C21B *13/08*

U.S. Cl. 75—36 **10 Claims**

1. A process for directly reducing iron-containing oxidic material to sponge iron by means of a moist solid carbonaceous reducing agent having a high volatile content in a rotary kiln in which the solid iron-containing charge and a gaseous atmosphere move in counter-current flow through the kiln characterizied in that solid carbonaceous reducing agents having a water content of 30–70% and a high volatile content are fed into the rotary kiln at the charging end thereof, the water content and the combustible gaseous constituents evolved by the devolatilization of the reducing agent and entering the drying zone of the rotary kiln and the heat content of the gases being so matched that the reducing agent is dried in the drying zone and the exhaust gas contains less than about 1% combustible gaseous constituents and the combustion of the combustible gaseous constituents in the drying zone is controlled by a feed of oxygen-containing gaseous into the rotary kiln.

4,144,053

PROCESSES FOR BLAST FURNACE OPERATIONS

William K. Kinzer, Northfield, and Robert E. Kusner, Brecksville, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Nov. 3, 1976, Ser. No. 738,446

Int. Cl.² C21B *5/04*

U.S. Cl. 75—42 **3 Claims**

1. In the process of operating a blast furnace by charging ore, coke and flux into the furnace and reducing the ore by oxidation of the coke, the improvement comprising the steps of employing coke derived from coal and enriched with an addition of at least 1% by weight of finely dispersed silica as the coke charge, and allowing the silica to react with condensed alkalis on the coke to form alkali silicates and thereby retard coke degradation.

4,144,054

PROCESS FOR THE REMOVAL OF IMPURITIES FROM ALUMINUM MELTS

Rudolf Stary, and Adolf Howald, both of Neuhausen am Rheinfall, Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Nov. 21, 1977, Ser. No. 853,329

Claims priority, application Switzerland, Dec. 21, 1976, 16073/76

Int. Cl.² C22B *21/06*

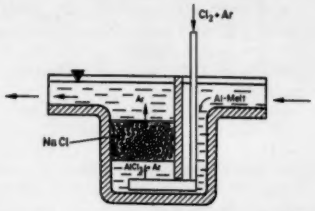
U.S. Cl. 75—68 R **10 Claims**

1. An improved process for the removal of sodium impurities from molten aluminum and aluminum alloy melts comprising:

providing a filter medium having an active surface, said active surface of said filter medium being composed of at least one solid metal chloride selected from the group consisting of alkali metal and alkaline earth metal chlorides;

fluxing said molten melt with reactive chlorine gas upstream of said filter medium so as to form aluminum chloride therein; and

passing said molten melt through said filter medium wherein said aluminum chloride is chemisorbed on said active surface, the temperature of said molten melt being below the melting point of said active surface wherein said sodium impurities in said molten melt reacts with said chemisorbed aluminum chloride on said filter medium active surface so as to remove said sodium impurities from said molten melt such that said molten melt downstream of said filter medium is substantially free of said sodium impurities.



4,144,055

METHOD OF PRODUCING BLISTER COPPER

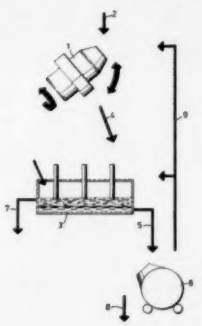
Stig A. Petersson, and Bengt S. Eriksson, both of Skelleftehamn, Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed Mar. 4, 1977, Ser. No. 774,454

Claims priority, application Sweden, Mar. 12, 1976, 76032382

Int. Cl.² C22B *15/06*

U.S. Cl. 75—73 **10 Claims**



1. A method of producing blister copper, wherein sulphidic copper raw material is smelted to form a matte and a slag in a rotary furnace arranged to rotate about an inclined axis at a rotary speed of from about 10 rpm to about 60 rpm in the presence of oxygen and slag formers and wherein the matte is converted to blister copper, which method comprises the steps of heating the rotary furnace to a temperature of at least 900° C.; charging simultaneously the copper raw material, slag former and oxygen to the rotary furnace to autogeneously smelt said raw material by means of heat obtained by burning sulphur contained in said raw material, so that a smelt comprising a matte having a desired copper content and a copper-containing slag is formed and maintained at a temperature of 1100°–1300° C.; treating the smelt obtained with at least one reductant selected from the group consisting of coke, coal, oil, natural gas, pyrite, chalcopyrite, pyrrhotite and additional amounts of said sulphidic copper raw material, so that the copper content in the slag is decreased; transferring the smelt batchwise to a holding furnace in which the matte and the slag are mutually separated; treating the slag in the holding furnace

during its passage therethrough to further decrease the copper content in the slag to a predetermined level; tapping-off the matte separated in the holding furnace and transferring said matte to a converter; and finally tapping-off the slag thus reduced and separated.

4,144,056

PROCESS FOR RECOVERING NICKEL, COBALT AND MANGANESE FROM THEIR OXIDE AND SILICATE ORES

Paul R. Kruesi, Golden, Colo., assignor to Cato Research Corp., Wheatridge, Colo.

Filed May 4, 1978, Ser. No. 902,869
Int. Cl.[2] C22B *23/00, 47/00*
U.S. Cl. 75—111 **17 Claims**

1. A process for the recovery of a metal selected from the group consisting of manganese, nickel and cobalt from its oxide or silicate which comprises:

(a) heating the oxide or silicate with ferric chloride in the absence of air in the presence of a volatility depressant salt selected from the group consisting of an alkali metal chloride and ammonium chloride to form the soluble metal chloride, and

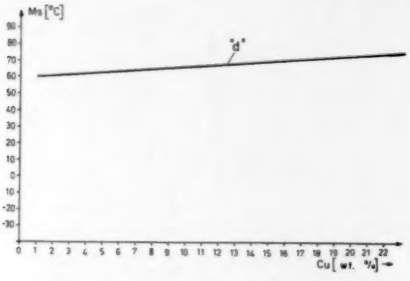
(b) recovering the metal from its formed soluble chloride.

4,144,057

SHAPE MEMORY ALLOYS

Keith Melton, Busslingen, and Olivier Mercier, Ennetbaden, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Aug. 25, 1977, Ser. No. 827,568
Claims priority, application Switzerland, Aug. 26, 1976, 10827/76
Int. Cl.[2] C22C *19/03*
U.S. Cl. 75—134 C **24 Claims**



1. A shape memory alloy whose base elements are nickel and titanium, which consists essentially of:

a mixture of 23 to 55 wt.% nickel, from 40 to 46.5 wt.% titanium and 0.5 to 30 wt.% copper with the balance being from 0.01 to 5 wt.% of at least one element selected from the group consisting of aluminum, zirconium, cobalt, chromium and iron.

4,144,058

AMORPHOUS METAL ALLOYS COMPOSED OF IRON, NICKEL, PHOSPHORUS, BORON AND, OPTIONALLY CARBON

Ho-Sou Chen, Warren, N.J., and Donald E. Polk, Boston, Mass., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 505,296, Sep. 12, 1974, abandoned, which is a division of Ser. No. 318,146, Dec. 26, 1972, Pat. No. 3,856,513. This application Jun. 9, 1976, Ser. No. 694,429
Int. Cl.[2] C22C *30/00, 19/03, 38/54*
U.S. Cl. 75—170 **8 Claims**

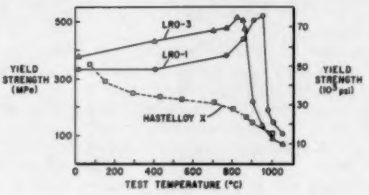
1. A metal alloy composed of $Fe_dNi_eP_fB_gC_h$ which is at least 50% amorphous, wherein d, e, f, g and h represent atomic percentages in the range of from 15 to 55, 30 to 70, 10 to 20, 1 to 10 and 0 to 5, respectively, f plus g plus h ranges from 15 to 25, and the total of the atomic percentages equals 100.

4,144,059

DUCTILE LONG RANGE ORDERED ALLOYS WITH HIGH CRITICAL ORDERING TEMPERATURE AND WROUGHT ARTICLES FABRICATED THEREFROM

Chain T. Liu, and Henry Inouye, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 14, 1978, Ser. No. 886,379
Int. Cl.[2] C22C *19/00*
U.S. Cl. 75—170 **11 Claims**



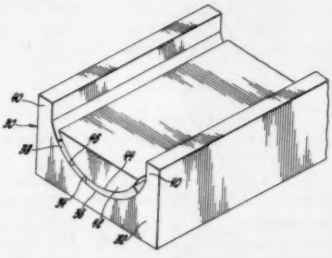
1. A long range ordered alloy composition having a critical ordering temperature greater than 850° C., a room temperature ultimate tensile strength greater than 900 MPa, and a room temperature tensile elongation greater than 20%, said alloy having the nominal $V(Fe, Co)_3$ or $V(Fe, Co, Ni)_3$ composition and comprising by weight 22–23% V, 14–30% Fe, and the remainder Co, or Co and Ni with an electron density no greater than 7.85.

4,144,060

METHOD OF FABRICATING RARE EARTH-TRANSITION METAL MAGNETS

William F. Jandeska, Rochester, and Charles F. Netherton, Marine City, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 3, 1978, Ser. No. 875,072
Int. Cl.[2] B22F *3/14, 3/16*; H01F *1/08*
U.S. Cl. 75—226 **2 Claims**



1. A method of making a rare earth-transition metal permanent magnet having a thin, curved shape by sintering a green, rare earth-transition metal powder compact formed substantially in the shape of said magnet with allowance for shrinkage upon subsequent densification and wherein the powder particles of said compact are magnetically aligned substantially radially with respect to its curvature, said method comprising

positioning a said green powder compact between a first die having a curved working surface substantially matching the concave side of said curved compact and a second die

having a curved working surface substantially matching the convex side of said curved compact,

heating said compact between said dies to a sintering temperature for said powder,

restraining said compact between said dies during said heating such that the concave side of said compact shrinks contiguously with the working surface of said first die, said first and second dies serving to prevent said compact from distorting without inhibiting its shrinkage, and

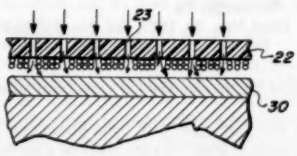
continuing to heat and restrain said compact until it reaches the desired density of said magnet,

whereby a freestanding permanent magnet is formed having substantially the same inside radius as said green compact, the magnetic domains of said magnet being substantially radially oriented with respect to its curvature.

4,144,061
TRANSFER DEVELOPMENT USING A FLUID SPACED DONOR MEMBER

Lloyd F. Bean, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 27, 1977, Ser. No. 810,224
Int. Cl.² G03G *13/08, 15/08*
U.S. Cl. 96—1 SD **4 Claims**



1. In an electrostatographic imaging process, which comprises forming an electrostatic latent image on an imaging surface, distributing toner material on the surface of a donor member, and developing said image by electrostatically transferring the toner material to said image from the surface of the donor member maintained in close proximity to the imaging surface:

the improvement comprising maintaining the donor member surface at a uniform spaced relationship to the imaging surface by applying fluid pressure through perforations in the donor member against the imaging surface.

4,144,062
ORGANOTELLURIUM (II) AND (IV) COMPOUNDS IN HEAT-DEVELOPABLE PHOTOGRAPHIC MATERIALS AND PROCESS

Mark Lelental, Penfield, and Henry J. Gysling, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 703,477, Jul. 8, 1976, abandoned. This application Nov. 3, 1977, Ser. No. 848,062
Int. Cl.² G03C *5/24, 1/76, 1/00, 1/02*
U.S. Cl. 96—114.1 **31 Claims**

1. In a heat developable, photographic element comprising a support having thereon in reactive association

a. a photographic metal compound,

b. an oxidation-reduction image-forming combination comprising:

i. a non-silver metal compound as an oxidizing agent, and

ii. a reducing agent, and

c. a binder,

the improvement wherein said non-silver metal compound as an oxidizing agent consists essentially of an organotellurium (II) or (IV) compound.

4,144,063
COLORED IMAGE FORMATION FROM MALEIMIDE COPOLYMERS

Howard C. Haas, Arlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

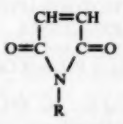
Continuation-in-part of Ser. No. 374,945, Jun. 29, 1973, abandoned. This application Sep. 18, 1974, Ser. No. 507,257
Int. Cl.² G03C *5/54, 5/16; C08G 69/44, 73/76*
U.S. Cl. 96—29 D **5 Claims**

4. A process of forming a colored image by diffusion transfer which comprises, in combination, the steps of:

(a) exposing a photographic film unit which comprises a plurality of layers including a support layer carrying a photosensitive silver halide layer having associated therewith a compound capable of providing, as a function of silver halide development, an imagewise distribution of an image-forming material, said compound being processing composition soluble and diffusible as a function of the point-to-point degree of exposure of said silver halide layer, and comprising an organic amine whose basic ionization constant is at least as large as that of ammonia, attached to a silver halide developing moiety;

(b) contacting said photographic film unit with an aqueous alkaline processing composition forming thereby an imagewise distribution of diffusible image-forming material as a function of the point-to-point degree of emulsion exposure; and

(c) transferring, by diffusion, at least a portion of said imagewise distribution of diffusible image-forming material to a layer comprising a copolymer of a first vinyl monomer corresponding to the formula

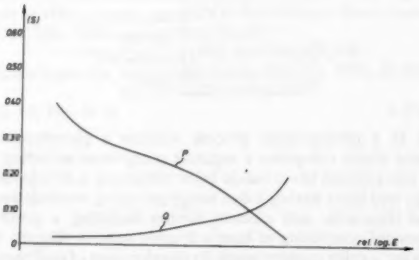


wherein R is selected from the group consisting of hydrogen and monovalent organic groups, and a second vinyl monomer which has a radical capable of forming a stable anion directly attached to at least one carbon of the carbon-carbon double bond.

4,144,064
PHOTOGRAPHIC MATERIAL FOR USE IN THE SILVER COMPLEX DIFFUSION TRANSFER PROCESS

Leon L. Vermeulen, Broechem, and Ludovicus M. Mertens, Borgerhout, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Sep. 26, 1977, Ser. No. 836,412
Int. Cl.² G03C *5/54, 1/48, 1/84*
U.S. Cl. 96—29 L **3 Claims**



1. A process for the production of halftone images of an original, which process comprises the steps of:

1. photographically exposing to a light-image which is a line

or screened image of the original, a photographic material comprising in order:

(1) a silver halide emulsion layer,

(2) a layer reflecting white light having a dry coating weight in the range of 5 g/sq.m to 20 g/sq.m and containing in an organic hydrophilic colloid binder white inorganic pigment particles in such an amount that said layer has a diffuse transmission density of 0.30 to 0.50 and a reflection density of 0.15 to 0.20,

(3) a subbing layer,

(4) a hydrophobic transparent film support,

(5) a subbing layer, and

(6) an antihalation layer having a dry coating weight in the range of 4 g/sq.m to 15 g/sq.m and containing dispersed in an organic hydrophilic colloid binder a non-bleachable black antihalation substance in such an amount that said layer has a diffuse transmission density of at least 2, said exposure being in the direction of the side of the material carrying the silver halide emulsion layer,

2. bringing the emulsion layer side of the exposed photographic material in contact with an image-receiving layer containing developing nuclei of an image receptor material in the presence of an aqueous alkaline liquid that makes the development of the exposed silver halide take place and of a silver halide complexing agent to effect the transfer by diffusion of silver halide complexes from the photographic material into the image-receiving layer to form a visible silver image therein, and

3. separating the exposed photographic material from the image receptor material.

4,144,065

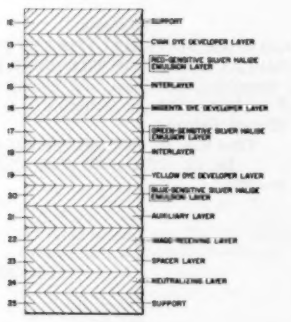
POLYSILICATES IN PHOTOGRAPHIC PRODUCTS AND PROCESSES

Ronald F. Lambert, Wayland, and Karl J. Schreiber, Waban, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 673,196, Apr. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 456,799, Apr. 1, 1974, abandoned, which is a continuation-in-part of Ser. No. 186,087, Oct. 4, 1971, abandoned. This application Mar. 7, 1978, Ser. No. 884,204

Int. Cl.[2] **G03C** *7/00, 1/40, 5/54, 5/30*

U.S. Cl. 96—29 D **20 Claims**



14. In a photographic process wherein a photosensitive element which comprises a negative component including at least one exposed silver halide layer containing a developable image; said layer having a dye image-providing material associated therewith, said element further including a positive component comprising at least a dyeable stratum adapted for receiving a color transfer image by development of said photosensitive element and wherein said element is developed by applying, between said positive and negative components, an aqueous alkaline processing composition which provides silver halide developing reagents to said photosensitive element and said processing composition includes opaque layer-providing materials dispersed therein, said dispersed materials comprising an inorganic reflecting pigment and at least one pH-sensitive, organic, optical filter agent, said processing composition having a pH above the pKa of said optical filter agent and being adapted, upon application in a layer to develop an exposed photosensitive layer and to provide sufficient opacity during the development period to prevent fogging of said photosensitive layer by actinic light incident on said applied layer of said dispersed materials when said film unit is developed in the presence of said actinic light, said dispersed materials being characterized as having a tendency to undergo a phase separation whereby certain random areas of said applied layer of said dispersed materials suffer a reduction in the quantum of said reflecting pigment; the improvement wherein said processing composition includes a photographically innocuous polysilicate cation exchange resin providing a cation exchange capacity between about 0.45 to about 2.70 millequivalents of cation per gram of resin, the amount of said cation exchange resin being sufficient to inhibit effectively said phase separation.

4,144,066

ELECTRON BOMBARDMENT METHOD FOR MAKING STAINED GLASS PHOTOMASKS

Fred M. Ernsberger, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 30, 1977, Ser. No. 856,063

Int. Cl.[2] **G03C** *5/08;* **B05D** *3/06*

U.S. Cl. 96—35.1 **5 Claims**

1. A method for making stained glass photomasks comprising:

placing a thin film source of stain-producing cations into contact with at least selected areas of a surface of a glass substrate;

bombarding the film with electrons of sufficient energy to penetrate through the film and into the glass so as to inject stain-producing cations into the glass underlying said selected areas of the glass substrate surface, and to reduce the injected cations to their atomic state, while adjacent areas of said glass surface are maintained essentially free from injected cations;

removing said thin film source from the surface of the glass; and

heating the glass substrate to agglomerate the injected stain-producing atoms within the glass into colloidal coloration centers, thereby producing a contrasting pattern of stained radiation absorbing zones and non-stained essentially transparent zones within the glass substrate.

4,144,067

LIGHT-SENSITIVE COPYING MATERIAL AND METHOD FOR THE PRODUCTION OF COLORED RELIEF IMAGES

Hans Ruckert, Naurod, and Rainer Unholz, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 22, 1977, Ser. No. 826,738

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1976, 2637768

Int. Cl.[2] **G03C** *5/00, 11/00, 1/52, 1/68*

U.S. Cl. 96—36 **13 Claims**

1. In a light-sensitive copying material, the copying layer of which comprises a water-soluble, curable binder and a diazonium salt polycondensation product of recurring units of the general types

$$(A\text{-}N_2X) \text{ and } (B)$$

which are linked to one another by intermediate members which have two bonds and are derived from a carbonyl com-

pound capable of undergoing a condensation reaction, in which

A is the radical of a compound of the formula

$$(R_1\text{-}R_3\text{-})_pR_2\text{-}N_2X$$

wherein

X denotes the anion of an acid which forms a water-soluble salt with the condensation product,

p denotes an integer from 1 to 3,

R_1 denotes an aromatic radical with at least one position capable of entering into a condensation reaction,

R_2 denotes a phenylene group which is unsubstituted or substituted by halogen atoms or carboxyl, sulfonyl, alkyl or alkoxy groups, and

R_3 denotes a single bond or one of the groups:

$-(CH_2)_q-NR_4-$

$-O-(CH_2)_r-NR_4-$

$-S-(CH_2)_r-NR_4-$

$-S-CH_2CO-NR_4-$

$-O-R_5-O-$

$-O-$

$-S-$ or

$-CO-NR_4-$,

in which q is a number from 0 to 5, r is a number from 2 to 5, R_4 is hydrogen, an alkyl group with 1 to 5 carbon atoms, an aralkyl group with 7 to 12 carbon atoms or an aryl group with 6 to 12 carbon atoms, and R_5 is an arylene group with 6 to 12 carbon atoms, and

B is the radical of a compound which is free of diazonium groups and is able to undergo a condensation reaction, at least at one point in the molecule, with formaldehyde in an acid medium, which compound is selected from the group consisting of aromtic amines, phenols, thiophenols, phenol ethers, aromatic thioethers, aromatic hydrocarbons, aromatic heterocyclic compounds and organic acid amides,

the improvement that fish glue is the water-soluble, curable binder.

4,144,068

METHOD FOR COLOR PHOTOGRAPHIC PROCESSING

Hiroshi Ishibashi; Nobuo Sakai; Kiyoshi Imai, and Junya Nakajima, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

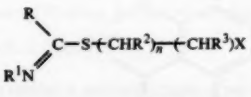
Filed Jan. 30, 1978, Ser. No. 873,750

Claims priority, application Japan, Jan. 28, 1977, 52-8521

Int. Cl.[2] G03C *5/50, 5/32*

U.S. Cl. 96—60 R **9 Claims**

1. In a method of processing an image-wise exposed silver halide color photographic material by applying thereto a color development processing and a silver removal processing, the improvement which comprises, after the color development processing, processing the silver halide color photographic material with a processing bath containing a compound represented by the following general formula (I) as a bleach accelerator:



(I)

wherein R represents an $-NR^4R^5$ group, an $-O-R^6$ group or an $-S-R^6$ group; R^6 represents an atomic group necessary for forming a ring together with R^1; R^1, R^4 and R^5, which may be the same or different, each represents a hydrogen atom or an alkyl group; R^2 and R^3, which may be the same or different, each represents a hydrogen atom or a methyl group; n represents 0, 1 or 2; X represents an amino group, a hydroxyl group, a $-COO(M)_m$ group or an $-SO_3(M)_m$ group; M represents a cation rendering the compound water soluble; and m represents 0 or 1 and is 0 when the compound forms an inner salt; wherein the nitrogen atom bound to R^1 may be quaternized with the charge of the quaternized nitrogen atom being neutralized by an acid group and R^1 may form a ring together with R^4 or R^5, wherein the processing bath is used as a bleach bath or a blix bath, each containing a ferric ion complex as a bleaching agent, or prior thereto.

4,144,069

METHOD OF IMAGE FORMATION

Masakazu Yoneyama; Noriyuki Inoue; Nobuo Tsuji, and Kimitaka Kameoka, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 8, 1977, Ser. No. 775,682

Claims priority, application Japan, Mar. 8, 1976, 51-24783

Int. Cl.[2] G03C *5/24, 5/30, 1/06, 1/28*

U.S. Cl. 96—63 **11 Claims**

1. An image forming method comprising image-wise exposing and development processing a silver halide photographic material with at least one polyoxytetramethylene-containing block copolymer represented by the following general formula (I):

$$Y[CH_2CH_2CH_2CH_2O)_m-(CH_2CH_2O)_n-R]_x \quad (I)$$

and/or the general formula (II):

$$HO(CH_2CH_2O)_a(CH_2CH_2CH_2CH_2O)_b(CH_2CH_2O)_cH \quad (II)$$

present in the photographic material wherein Y represents the radical obtained upon eliminating x active hydrogens from an organic compound selected from the group consisting of monohydroxy compounds, polyhydroxy compounds, monocarboxylic acids, polycarboxylic acids, thiols and amines, wherein said monohydroxy compounds are represented by the formula R_1OH, said polyhydroxy compounds are represented by the formula $R_1(OH)_z$, said monocarboxylic acids are represented by the formula R_1COOH, said polycarboxylic acids are represented by the formula $R_1(COOH)_z$, said thiol compounds are represented by the formula R_1SH and said amines are represented by the formula R_1NH_2, wherein R_1 is an alkyl group having 1 to 20 carbon atoms, an aryl group having 6 to 20 carbon atoms, an aralkyl group having 1 to 20 carbon atoms in the alkyl moiety and 6 to 20 carbon atoms in the aryl moiety, and z is 2 or 3; R represents a hydrogen atom or an alkyl group containing 1 to 18 carbon atoms; m is an integer of from 5 to 50; n is an integer of from 10 to 100; b is an integer of from 8 to 50; a + c ranges from 5 to 100; and the polyoxyethylene moieties therein comprise about 10 to about 70% by weight of the total weight of the copolymer; and x represents an integer of from 1 to 3.

4,144,070

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIALS

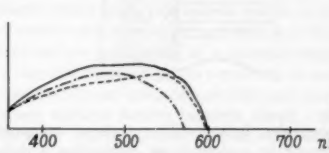
Masayuki Matsumoto; Toshio Nagatani, and Noboru Fujimori, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Nihonbashi-Muro, Japan

Filed Nov. 21, 1977, Ser. No. 853,520

Claims priority, application Japan, Nov. 22, 1976, 51-140475

Int. Cl.[2] G03C *5/30, 1/08*

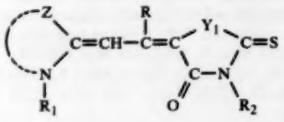
U.S. Cl. 96—66 R **6 Claims**



1. A light-sensitive silver halide photographic material com-

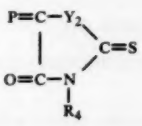
prising a support and thereon at least one silver halide emulsion layer containing silver halide, said silver halide emulsion layer containing at least one member selected from compounds represented by the following general formula [I] and at least one member selected from compounds represented by the following general formula [II]:

General formula [I]

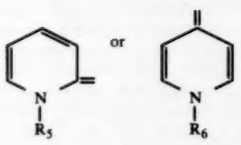


wherein Z represents a non-metal atomic group necessary for forming a pyrroline ring, Y_1 represents sulfur, R represents hydrogen or lower alkyl, and R_1 and R_2 individually represent an alkyl-, alkenyl- or aryl-group;

General formula [II]



wherein P represents



(in which R_5 and R_6 individually represent an alkyl-, alkenyl- or aryl-group), Y_2 represents oxygen, sulfur, selenium, or an $>N-R_7$ group (in which R_7 represents an alkyl-, alkenyl- or aryl-group), and R_4 represents an alkyl-, alkenyl- or aryl-group.

4,144,071

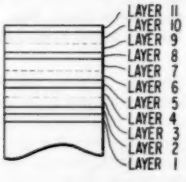
PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Keisuke Shiba; Toshiaki Aono; Takeshi Hirose, and Tadao Shishido, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

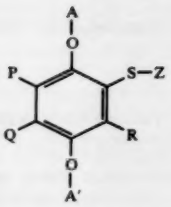
Continuation of Ser. No. 566,578, Apr. 8, 1975, abandoned. This application Feb. 28, 1977, Ser. No. 772,895

Int. Cl.[2] G03C *3/00, 1/06, 1/34*

U.S. Cl. 96—74 **29 Claims**



1. A photographic light-sensitive material comprising at least one hydrophilic colloid layer containing a dispersion containing at least one reducing compound having an oxidation potential of from about 0.5 to 1.5 volts and at least one compound represented by the following general formula (I):



(I)

wherein A and A′ which may be the same or different, each represents a hydrogen atom or an alkaline-hydrolyzable group, or A′ may combine with R or Q to form a ring; P, Q, and R, which may be the same or different, each represents a hydrogen atom, an alkyl group, an aryl group, a halogen atom, a hydroxyl group, a —Y—W group wherein Y represents an oxygen atom or a sulfur atom, and W represents an alkyl group, an aryl group, or a heterocyclic group; wherein Z represents a heterocyclic group which is substantially photographically inert in the bonded state; with at least one ballasting group having at least 5 carbon atoms being contained in said molecule.

4,144,072

THERMALLY DEVELOPABLE LIGHT-SENSITIVE MATERIAL

Shinpei Ikenoue; Takao Masuda, and Nobuyoshi Sekikawa, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 25, 1977, Ser. No. 844,858

Claims priority, application Japan, Oct. 29, 1976, 51-130769

Int. Cl.[2] G03C *1/02, 1/76*

U.S. Cl. 96—114.1 **8 Claims**

1. In a thermally developable light-sensitive material containing at least

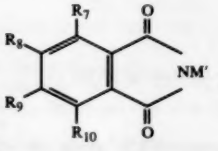
(a) an organic silver salt;

(b) a photocatalyst, and

(c) a reducing agent in a support and/or in one or more layers thereon, the improvement which comprises said thermally developable light-sensitive material additionally containing

(d) at least one phthalazinone and

(e) at least one phthalimide in said one or more layers, in an over coated layer on said one or more layers, in a subbing layer between the support and said one or more layers and/or in said support said phthalimide being represented by the general formula (II):



(II)

wherein R_7, R_8, R_9 and R_{10} each represents a hydrogen atom, a halogen atom, a hydroxy group, a nitro group, an amino group and a carbon-containing substituent having 1 to 20 carbon atoms which may further contain an oxygen atom, a nitrogen atom, a sulfur atom, or a halogen atom but at least one of R_7, R_8, R_9 or R_{10} represents a halogen atom; and R_7 and R_8, R_8 and R_9, and R_9 and R_{10}, each when combined together, may form an aromatic ring; and M′ represents a hydrogen atom or a monovalent metal atom but at least one of R_7, R_8, R_9 and R_{10} is a halogen atom.

4,144,073

PHOTOPOLYMERIZABLE COMPOSITION FOR THE MANUFACTURE OF RELIEF PRINTING PLATES

Bernd Bronstert, Frankenthal; Werner Lenz, Bad Duerkheim; Heinrich Hartmann, Limburgerhof; Heinz-Ulrich Werther, Wachenheim, and Manfred Zuerger, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 6, 1977, Ser. No. 840,029
Int. Cl.[2] G03C *1/68, 5/00*
U.S. Cl. 96—115 P 4 Claims

1. A photopolymerizable composition for the manufacture of letterpress printing plates or relief plates for making mats, which comprises a mixture of:

(a) from 37 to 78% by weight of an alcohol-soluble linear polyamide,

(b) from 0.01 to 5% by weight of at least one photoinitiator,

(c) from 15 to 40% by weight of a diether or triether monomer (M^1) of the formula

$$(CH_2{=}CR^1{-}CO{-}NH{-}CH_2{-}O)_nR^2 \quad (I)$$

where n is 2 or 3, R^1 is H or CH_3 (and the various R^1 are identical or different), and R^2 is an n-valent aliphatic radical of 2 to 6 carbon atoms, and

(d) from 6 to 18% by weight of a monomer (M^2) of the formula T,140

where R^3 and R^4 are H or CH_3 (and are identical or different), A^1 and A^2 are alkylene of 2 or 3 carbon atoms (and are identical or different) and Z is 2,4-toluylene or 2,6-toluylene, the weight ratio of the monomer M^1 to the monomer M^2 being at least 1.5:1, the above percentages being based on the mixture of polyamide, photoinitiator and monomers.

4,144,074

INORGANIC COATING COMPOSITION

Hitoshi Itoh, and Iwao Momiyama, both of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1977, Ser. No. 852,844
Claims priority, application Japan, Nov. 30, 1976, 51-143750; Dec. 9, 1976, 51-147992; Dec. 9, 1976, 51-147993
Int. Cl.[2] C23C *3/00*
U.S. Cl. 106—1.17 11 Claims

1. An inorganic coating composition comprising: an aqueous dispersion of colloidal silica (A), laminar aluminum oxide and/or aluminum hydroxide (B), water-soluble amino-alcohol (C), and at least one coagulating agent selected from the group consisting of metallic zinc, zinc compounds and oxides and hydroxides of alkaline earth metals (D), the particle shape if said component (B) being defined by the formulae:

$$50 \geqq w/h \geqq 2 \text{ and } 5 \geqq l/w \geqq 1,$$

in which the symbol l indicates length of particles, w indicates width and h indicates height, and the quantity thereof to be used being such that non-volatile matter in said coating composition is in the range of 40 to 90% by weight, and further, the molar ratio of said component (C) to said component (A) (amino-alcohol/SiO_2) being in the range of 0.01/1.0–1.0/1.0, the molar ratio of said component (D) to said component (A) (RO/SiO_2 where R represents an alkaline earth metal ion, or Zn/SiO_2) being in the range of 0.01/1.0–1.0/1.0, and the weight ratio of the colloidal silica contained in said component (A) to water plus said colloidal silica in said composition ($SiO_2/SiO_2 + H_2O$) is not less than 0.1.

4,144,075

WAX COMPOSITION FOR INVESTMENT CASTING AND CASTING METHOD

Myron Koenig, Mamaroneck, N.Y., assignor to M. Argueso & Co., Inc., Mamaroneck, N.Y.

Continuation-in-part of Ser. No. 653,359, Jan. 29, 1976, abandoned, which is a continuation of Ser. No. 533,633, Dec. 17, 1974, abandoned. This application Mar. 31, 1977, Ser. No. 783,207
Int. Cl.[2] B28B *7/34*
U.S. Cl. 106—38.8 9 Claims

1. An investment casting wax composition for use in the investment casting wax process which consists essentially of a base wax melting in the range of 120° to 180° F. and about 5 to 60% by weight of the final composition of hexamethylenetetramine as a filler, said wax composition having sufficient hardness to form acceptable patterns, and said wax composition being dimensionally stable and having a hardness measurement based on the ASTM D-5 needle penetration test using the Investment Casting Institute modification of a 450 gram total weight on the needlepoint, of from 2 to 30 tenths of millimeters.

4,144,076

OPTICAL GLASS

Shizuo Matsumaru, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 29, 1977, Ser. No. 855,627
Claims priority, application Japan, Dec. 7, 1976, 51-146083
Int. Cl.[2] C03C *3/14, 3/12*
U.S. Cl. 106—47 Q 4 Claims

1. An optical glass having a refractive index (nd) ranging from 1.69 to 1.80 and Abbe number (ν d) ranging from 43 to 55 consisting essentially of in percent by weight:

B_2O_3	25–40
ZnO	11–30
La_2O_3	28–44
Y_2O_3	1–25

alkaline earth metal oxides 0-20

SiO_2	0–5
Al_2O_3	0–5
PbO	0–15
ZrO_2	0–10
Ta_2O_5	0–10

4,144,077

HIGH TEMPERATURE CEMENT SYSTEM

Julius P. Gallus, Anaheim, Calif., assignor to Union Oil Company of California, Brea, Calif.

Continuation-in-part of Ser. No. 700,387, Jun. 28, 1976, Pat. No. 4,069,870. This application Oct. 25, 1977, Ser. No. 844,642
Int. Cl.[2] C04B *7/02, 7/32*
U.S. Cl. 106—97 21 Claims

1. A cement system which upon hydration and curing forms a hardened cement mass, said cement system consisting essentially of cement and an effective amount, less than 20 weight percent of said cement system, of a carbon-containing cement additive selected from the group consisting of anthracite, calcined coke, uncalcined coke, raw oil shale and burned oil shale, said cement additive having between about 1 and about 15 weight percent volatile material, said amount being effective to impart to said cement mass an ultimate compressive strength of at least about 1000 p.s.i. and an ultimate permeability less than about 1 millidarcy when exposed to high temperatures.

4,144,078

MASONRY CEMENT

Omar K. Colwell, Ocala, Fla., assignor to Mid-Florida Mining Co., Lowell, Fla.

Continuation-in-part of Ser. No. 692,356, Jun. 3, 1976, abandoned, which is a continuation of Ser. No. 520,167, Nov. 1, 1974, abandoned. This application Feb. 15, 1978, Ser. No. 877,869

Int. Cl.[2] C04B 7/02

U.S. Cl. 106—97 11 Claims

1. In a masonry mortar composition consisting essentially in the dry state of Portland cement and aggregate present in amounts sufficient to form a conventional mortar composition, the improvement consisting of the inclusion in the composition of a calcium magnesium aluminum silicate having a plasticity value greater than 700, said calcium magnesium aluminum silicate present in a ratio between 3:7 and 4:6 by weight to Portland cement, the ratio of Portland cement to fine aggregate being between 1:4 and 3:20 by weight and the composition having a water retention greater than 75% when sufficient water is added to obtain a flow of 110 ± 5.

4,144,079

RAYON FIBERS CONTAINING STARCH

Frederick R. Smith, Toms Brook, Va., assignor to Avtex Fibers Inc., Valley Forge, Pa.

Continuation-in-part of Ser. No. 629,952, Nov. 7, 1975, abandoned. This application Jun. 30, 1977, Ser. No. 811,793

Int. Cl.[2] C08L 1/24; D01F 2/08

U.S. Cl. 106—164 28 Claims

1. Process for preparing starch-containing rayon fibers which comprises forming a slurry of starch granules in aqueous medium, adding sodium hydroxide (NaOH) to said slurry to produce an aqueous alkaline solution of starch, blending said solution with viscose, extruding the starch-containing viscose in fiber form and regenerating the cellulose in the extruded viscose to form starch-containing regenerated cellulose fibers, said starch having an amylopectin content of at least 60 percent.

4,144,080

PROCESS FOR MAKING AMINE OXIDE SOLUTION OF CELLULOSE

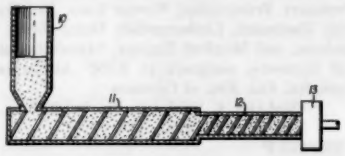
Clarence C. McCorsley, III, Asheville, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Filed Jul. 26, 1977, Ser. No. 819,082

Int. Cl.[2] C08L 1/02

U.S. Cl. 106—186 16 Claims

1. A process for making a solution of cellulose in a tertiary amine oxide which comprises dissolving solid cellulose containing a tertiary amine oxide in an extruder and extruding the



resulting solution from the said extruder before significant reduction in molecular weight of the cellulose occurs.

4,144,081

NITROCELLULOSE COATING COMPOSITION

Peter van der Heem, Perryville, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Continuation of Ser. No. 710,086, Jul. 30, 1976, abandoned. This application Nov. 18, 1977, Ser. No. 852,759

Int. Cl.[2] C08L 1/18

U.S. Cl. 106—193 J 2 Claims

1. In a coating composition comprising nitrocellulose, a solvent therefor and a pigmentary flatting agent; the improvement comprising, as said agent, an amorphous alkali metal aluminocarbonate of the following general structure:

$$XM_2O{:}Al_2O_3{:}YCO_2{:}ZH_2O$$

wherein M is an alkali metal, X is an integer ranging from about 0.5 to 1.0, Y is an integer ranging from about 0.5 to 2.0, and Z is an integer ranging from about 1 to 4; said aluminocarbonate being present in an amount sufficient to exert flatting properties to said composition.

4,144,082

SULFUR PLASTICIZING COMPOSITION

Milutin Simic, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 17, 1977, Ser. No. 853,015

Int. Cl.[2] C07G 17/00; C09K 3/00

U.S. Cl. 106—287.24 16 Claims

1. A sulfur plasticizing composition comprising (a) an aromatic polysulfide prepared by a base-catalyzed reaction of sulfur with an aromatic carbocyclic or heterocyclic compound substituted by at least one functional group of the class —OH or —NHR in which R is hydrogen or lower alkyl; (b) a linear aliphatic polysulfide; and (c) an olefinic-type unsaturated carboxylic acid.

4,144,083

METHOD FOR CONTROLLING THE VISCOSITY OF DISPERSED CLAY SLURRIES

William F. Abercrombie, Jr., Macon, Ga., assignor to J. M. Huber Corporation, Locust, N.J.

Continuation-in-part of Ser. No. 479,715, Jun. 17, 1974, abandoned. This application Nov. 18, 1977, Ser. No. 852,631

Int. Cl.[2] C09C 1/42

U.S. Cl. 106—288 B 3 Claims

1. A method of maintaining the low shear viscosity of a kaolin clay slurry at a substantially uniform and low level while the slurry is being shipped or stored, said method comprising the steps of:

(a) forming an aqueous slurry of finely divided particulate kaolin clay pigments having a clay solids content of from 60 to 72% by weight;

(b) adding to the slurry from 0.5 to 3.0 pounds of a compound per ton of said clay, based on the dry weight of said clay pigment; wherein said compound is selected from the group consisting of citric acid and sodium citrate; and

(c) maintaining said compound in said slurry for at least

seven days to maintain the low shear viscosity of said slurry at a substantially uniform and low level, such that the low shear viscosity will be below 340 centipoises for the first 35 days of storage or shipment.

4,144,084

METHOD FOR CONTROLLING THE VISCOSITY OF DISPERSED CLAY SLURRIES

William F. Abercrombie, Jr., Macon, Ga., assignor to J. M. Huber Corporation, Locust, N.J.

Continuation-in-part of Ser. No. 479,976, Jun. 17, 1974, abandoned. This application Nov. 18, 1977, Ser. No. 852,632

Int. Cl.[2] C09C *1/42*

U.S. Cl. 106—288 B **3 Claims**

1. A method of maintaining the low shear viscosity of a kaolin clay slurry at a substantially uniform and low level while the slurry is being shipped or stored, said method comprising the steps of:

(a) forming an aqueous slurry of finely divided particulate kaolin clay pigments having a clay solids content of from 60 to 70% by weight;

(b) adding to the slurry from 0.5 to 3.0 pounds of a compound per ton of said clay, based on the dry weight of said clay pigment; wherein said compound is selected from the group consisting of tartaric acid and sodium tartarate; and

(c) maintaining said compound in said slurry for at least seven days to maintain the low shear viscosity of said slurry at a substantially uniform and low level, such that the low shear viscosity will be below 710 centipoises for the first 77 days of storage or shipment.

4,144,085

METHOD FOR CONTROLLING THE VISCOSITY OF DISPERSED CLAY SLURRIES

William F. Abercrombie, Jr., Macon, Ga., assignor to J. M. Huber Corporation, Locust, N.J.

Continuation-in-part of Ser. No. 479,711, Jun. 17, 1974, abandoned. This application Nov. 18, 1977, Ser. No. 852,633

Int. Cl.[2] C09C *1/42*

U.S. Cl. 106—288 B **3 Claims**

1. A method of maintaining the low shear viscosity of a kaolin clay slurry at a substantially uniform and low level while the slurry is being shipped or stored, said method comprising the steps of:

(a) forming an aqueous slurry of finely divided particulate kaolin clay pigments having a clay solids content of from 60 to 72% by weight;

(b) adding to the slurry from 0.5 to 3.0 pounds of a compound per ton of said clay, based on the dry weight of said clay pigment; wherein said compound is selected from the group consisting of gluconic acid and sodium gluconate; and

(c) maintaining said compound in said slurry for at least seven days to maintain the low shear viscosity of said slurry at a substantially uniform and low level, such that the low shear viscosity will be below 350 centipoises for the first 28 days of storage or shipment.

4,144,086

ADDITIVE FOR CONCRETE

Claes I. Helgesson, Åkersberga, Sweden, assignor to AB Alfong Betonghardningsmedel, Stockholm, Sweden

Continuation of Ser. No. 637,588, Dec. 4, 1975, abandoned. This application Sep. 12, 1977, Ser. No. 832,672

Claims priority, application Sweden, Dec. 23, 1974, 7416250

Int. Cl.[2] C04B *31/30*

U.S. Cl. 106—315 **1 Claim**

1. An additive for concrete consisting essentially of a substantially saturated aqueous solution of sodium sulfate having suspended therein 10 to 70% by weight of the total weight of the additive of fine silica particles and 0.002 to 2% by weight of the total weight of the additive of a wetting agent consisting of a lyotropic liquid crystal.

4,144,087

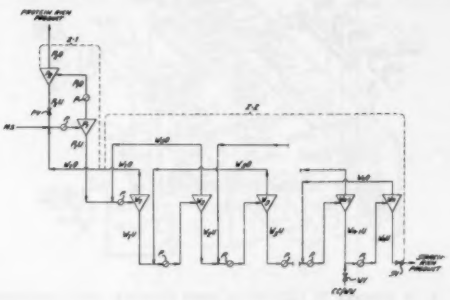
SYSTEM FOR SEPARATING MILL STARCH TO OBTAIN A PROTEIN-RICH PRODUCT AND A STARCH-RICH PRODUCT

Vincent P. Chwalek, Bolingbrook, and Clifford W. Schwartz, Willowbrook, both of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Oct. 22, 1976, Ser. No. 734,683

Int. Cl.[2] C13L *1/00, 3/00*

U.S. Cl. 127—24 **32 Claims**



1. A system for obtaining a protein-rich product and a starch-rich product from the mill starch fraction of a corn wet milling process, said system comprising:

a first separation zone containing at least two protein separation stages and a second separation zone stage a plurality of starch washing stages, each stage of said protein separation stages and each stage of said starch washing stages comprising a plurality of hydrocyclones arranged in parallel within a housing, said hydrocyclones comprising a vortex member, a conical member and an apex member;

means for introducing a counter current stream of wash water through said system adjacent the penultimate stages of said starch washing stages;

means for feeding said mill starch fraction under pressure successively through said protein separation stages such that said mill starch fraction is separated into a protein-rich stream and a starch enriched stream, said protein-rich stream being discharged through the vortex members of said hydrocyclones and said starch-enriched stream being discharged through the apex members of said hydrocyclones;

means for maintaining the pressure differential ΔP across each of said protein separation stages at at least about 100 p.s.i.;

means for removing a protein-rich stream from the last stage of said protein separation stages;

means for delivering a starch-enriched stream discharged from the apex member of the second of said protein separation stages to said mill starch fraction feed means such that said stream is combined with said mill starch fraction;

means for feeding the starch enriched stream discharged from the apex member of the first of said protein separation stages under pressure successively through said plurality of starch washing stages such that the lighter, slower settling materials are discharged through the vortex members of said hydrocyclones and the heavier, faster settling materials are discharged through the apex members of said hydrocyclones, said faster settling materials consisting essentially of an increasingly enriched starch stream;

means for recirculating lighter, slower settling materials discharged from said second separation zone to be combined with said mill starch fraction;

means for maintaining the pressure differential ΔPW across

each of said successive starch washing stages at at least about 80 p.s.i.; and,

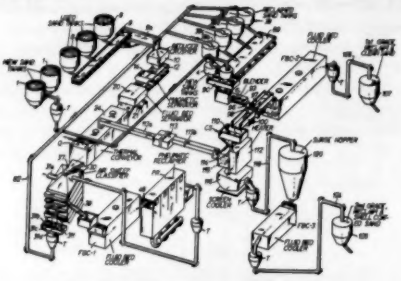
means for removing the enriched starch stream from the last stage of said starch washing stages.

4,144,088

PROCESS OF RECLAIMING USED FOUNDRY SAND

Willard L. Adams, Muskego, Wis., assignor to Kenzler Engineering Company, Inc., Milwaukee, Wis.

Filed Jan. 19, 1977, Ser. No. 760,533
Int. Cl.[2] B08B *7/02, 7/04*
U.S. Cl. 134—2 **6 Claims**



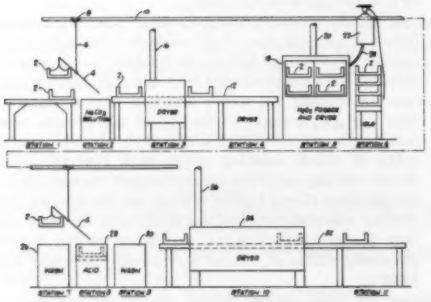
1. A process of reclaiming used foundry sand containing magnetic and non-metallic foreign material comprising the steps of reducing the size of the used foundry sand by crushing, separating the magnetic material and at least some of the foreign non-metallic material from the crushed sand, passing the crushed sand through a furnace and heating the crushed sand to about 1400° F. to expand the sand and to contract the sand to thereby separate foreign material from the sand, cooling the heated sand to about 400°-500° F. classifying the cooled sand as to size in an air sweep classifier, further cooling sufficiently coarse agglomerated classified sand and then passing said further cooled coarse sand to a pneumatic reclaimer and scrubbing the coarse sand to further reduce agglomeration and separate further foreign material therefrom, passing the further reduced sand back into said air sweep classifier for size classification thereof, and conveying said further reduced and classified sand to a storage bin.

4,144,089

PROCESS FOR BLEACHING WOODEN ARTICLES

Jeffrey T. Zemans, Painesville, Ohio, assignor to True Temper Corporation, Cleveland, Ohio

Filed Aug. 19, 1977, Ser. No. 825,977
Int. Cl.[2] B27K *5/02*
U.S. Cl. 134—2 **12 Claims**



1. A method for bleaching a wooden article, said method comprising the steps of:

A. contacting the wooden article with a basic solution;

B. subjecting the wooden article to a bleaching agent mist including peroxide; and

C. contacting the wooden article with weak acid to neutralize alkali residue on the article.

4,144,090

NON-OXIDATIVE REMOVAL OF GOLD FILMS

Helmut Franz, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 25, 1977, Ser. No. 844,943
Int. Cl.[2] B08B *3/08*
U.S. Cl. 134—3 **6 Claims**

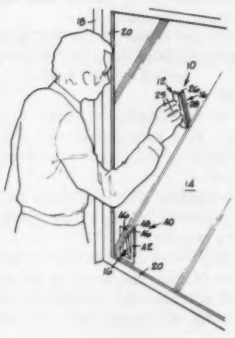
1. A method for debonding a gold film from a metallic gold-coated surface of a glass article as flakes of gold metal comprising contacting the gold-coated surface with an acidic aqueous solution consisting essentially of a soluble halide selected from the group consisting of alkali metal halides, alkaline earth metal halides, ammonium halides and hydrogen halides, said halide being present in said solution in an amount sufficient to debond the metallic gold from the surface of the article.

4,144,091

WINDOW WIPE

Nguon T. Tran, 786 9th Ave., San Francisco, Calif. 94118

Filed Dec. 1, 1977, Ser. No. 856,501
Int. Cl.[2] B08B *7/00;* **A47L** *1/08*
U.S. Cl. 134—6 **6 Claims**



1. The method of wiping the outside of a window, comprising:

affixing a container to the outside of said window,

placing a cleaning element in said container,

using a magnet on the inside of said window to move said cleaning element out of said container and across the outside surface of said window and back into said container, and

removing the magnet from the inside of the window after the cleaning element is back into the container.

2. A window wipe, comprising:

a magnet adapted to be moved over the inner surface of a window,

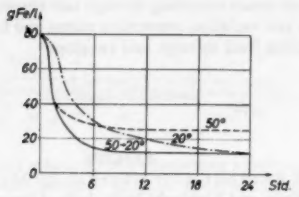
a container having a plurality of compartments affixed to the outside of said window, and

at least one cleaning element in said container whereby one cleaning element is caused to move over the outside surface of said window by movement of said magnet.

4,144,092
PROCESS FOR REGENERATING A NITRIC ACID-HYDROFLUORIC ACID PICKLING SOLUTION

Albert Krepler, Vienna, Austria, assignor to Ruthner Industrieanlagen-Aktiengesellschaft, Vienna, Austria

Continuation-in-part of Ser. No. 665,227, Mar. 9, 1976, abandoned. This application Jan. 5, 1978, Ser. No. 867,096
Claims priority, application Austria, Mar. 10, 1975 1826/75
Int. Cl.² B08B 7/04
U.S. Cl. 134—12 **14 Claims**



1. In the process of pickling metals with mixed aqueous solutions containing hydrofluoric acid and nitric acid by contacting the metals with the solutions in a pickling zone and recovering components of resultant spent pickling solutions, said spent solutions containing metal dissolved during pickling, including iron, the improvement which comprises:

(i) rapidly evaporating the spent solution at boiling temperature in an evaporation zone to form a supersaturated concentrate containing 60 to 150 g/l Fe;

(ii) within less than 60 minutes from the commencement of evaporation and upon achieving the 60 to 150 g/l Fe desideratum, cooling the concentrate a first time to a temperature in the range of about 50° C. to about 100° C. and transferring it to a crystallization zone;

then cooling the concentrate a second time, in the crystallization zone, to a temperature in the range of about 30° C. to about 70° C., and maintaining, while stirring, this temperature for a period of 3 to 15 hours to effect crystallization;

(iv) lowering the temperature of the concentrate a third time, in the crystallization zone, below the cooling temperature of the second cooling and to a range of about 15° C. to about 30° C. and maintaining, while stirring, this temperature for a period of 3 to 15 hours to effect further crystallization; and

(v) separating the resulting crystals from resultant concentrate mother liquor, which mother liquor is suitable for additional pickling purposes.

4,144,093
PROCESS FOR MACHINE WASHING OF SOILED ARTICLES USING A WATER-INSOLUBLE CATION-EXCHANGE POLYMER

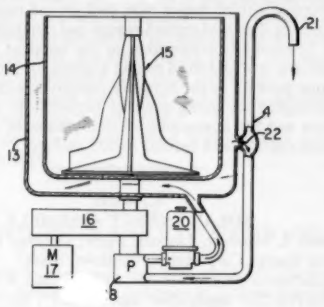
Elmar Reinwald, Dusseldorf-Holthausen; Milan J. Schwuger, Haan; Heinz Smolka, Langenfeld, and Peter Krings, Krefeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Continuation of Ser. No. 639,465, Dec. 10, 1975, abandoned. This application Aug. 4, 1977, Ser. No. 821,968
Claims priority, application Austria, Dec. 20, 1974, 10204/74
Int. Cl.² B08B 7/04
U.S. Cl. 134—13 **10 Claims**

1. A cyclic method for the machine washing of soiled solid materials with a washing solution prepared from hard water in a washing area, which comprises in sequence:

(a) forming a charge of an aqueous washing solution having a dissolved content between 0.05 gm/liter and 2 gm/liter of a water-soluble calcium-binding sequestrant, and customary surface-active compounds selected from the group consisting of an anionic detergent and a nonionic detergent,

(b) filtering said washing solution through a filter bed separate and spaced from the washing area to form a filtrate, said filter bed having a previously incorporated content of a water-insoluble cation-exchange polymer in particulate state having a swelled average particle diameter in excess of 20μ and having a calcium binding power of at least 2 mVal/gm, said polymer being a copolymer or graft polymer derived from olefinically-unsaturated carboxylic acids, said water-insoluble cation-exchange polymer being separated from said washing solution by said filter bed, the amount of the water-insoluble cation-exchange polymer



being so selected that the residual hardness of the filtrate is less than 20 mg CaO/liter;

(c) washing said soiled material with said filtrate as washing medium;

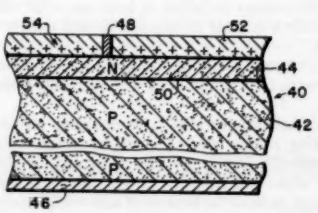
(d) continuously pumping at least part of said washing medium through said particulate cation-exchange polymer on said filter bed and recycling the filtrate having less than 20 mg CaO/l to said washing area, at such a rate that said washing medium passes a total of at least five times through said particulate cation-exchange polymer during said washing step; and

(e) continuing said recycling until said soiled solid material is substantially cleaned.

4,144,094
RADIATION RESPONSIVE CURRENT GENERATING CELL AND METHOD OF FORMING SAME

Michael G. Coleman, Tempe; Lawrence A. Grenon; Robert A. Pryor, both of Phoenix, and Fabio Restrepo, Scottsdale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 538,973, Jan. 6, 1975, abandoned. This application Nov. 29, 1976, Ser. No. 745,937
Int. Cl.² H01l 31/06
U.S. Cl. 136—89 CC **15 Claims**



1. A cell for generating current in response to incident radiation, comprising: a body including a first region of a first conductivity type, a second region of opposite conductivity type diffused into a portion of said first region for forming a PN

junction; and a third region disposed over said second region and said third region being of a different material than said second region and comprising a material being substantially transparent to the incident radiation, and said third region comprising dopants for providing, absent the application of an external voltage potential to said third region, ions of the same polarity as the minority carriers associated with said second region for aiding minority carrier flow across said PN junction and for minimizing recombination of second region minority carriers at a second region surface.

10. A method for forming a cell for generating current in response to incident radiation, comprising: providing a body including a first region of a first conductivity type, diffusing a portion of said body to form a second region of opposite conductivity within said first region for forming a PN junction; and forming a third region over said second region of a different material than said second region and comprising a material being substantially transparent to the incident radiation; and introducing into said third region dopants for providing ions of the same polarity as the minority carriers associated with said second region for aiding minority carrier flow across said PN junction and for minimizing recombination of second region minority carriers at a second region surface.

4,144,095

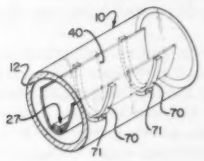
SOLAR ENERGY ASSEMBLY

Abraham I. Mlavsky, Lincoln, Mass., assignor to Mobil Tyco Solar Energy Corporation, Waltham, Mass.

Continuation-in-part of Ser. No. 611,087, Sep. 8, 1975, Pat. No. 4,078,944. This application Apr. 27, 1977, Ser. No. 791,217

Int. Cl.[2] H01L *31/06*

U.S. Cl. 136—89 PC **9 Claims**



1. A solar energy assembly comprising, in combination:

at least one hermetically sealed tubular envelope;

said envelope including a center axis and a wall adapted to pass incident solar radiation to the interior of said envelope;

a radiation collector disposed inside said envelope and adapted to concentrate said solar radiation received through sais wall, said collector having a configuration at least partially defining an elongated trough open to said incident radiation and extending substantially parallel to said center axis;

radiation conversion means positioned inside said envelope to receive said concentrated radiation, said radiation conversion means including at least one solar cell adapted to provide a current in response to said concentrated radiation;

means for electrically connecting said radiation conversion means to the exterior of said hermetically sealed envelope; and

means, including at least two mounting elements, for supporting at least said radiation collector within said tube positionally invariant relative to said envelope, each of said mounting elements at least partially encircling said trough, at least the bottom of said trough being secured to said mounting means.

5. A solar energy assembly comprising, in combination:

at least one hermetically sealed envelope;

said envelope including a wall adapted to pass incident solar radiation to the interior of said envelope;

a radiation collector disposed inside said envelope adapted to concentrate said solar radiation received through said wall;

radiation conversion means positioned inside said envelope to receive said concentrated radiation, said radiation conversion means including at least one solar cell adapted to provide a current in response to said concentrated radiation;

means for electrically connecting said radiation conversion means to the exterior of said hermetically sealed envelope; and

conduit means extending through said envelope for supporting said radiation conversion means and for conducting a cooling fluid through said envelope.

4,144,096

SOLAR BATTERY AND METHOD OF MANUFACTURE

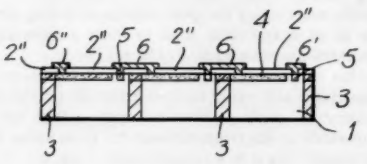
Shinji Wada, and Yoshiyuki Isobe, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 27, 1977, Ser. No. 864,289

Claims priority, application Japan, Dec. 27, 1976, 51-158878; Jan. 26, 1977, 52-7412

Int. Cl.[2] H01L *31/06*

U.S. Cl. 136—89 P **16 Claims**



1. A solar battery including a plurality of P-N junction unit solar cells comprising:

a semiconductive substrate of given conductivity type having a light receiving surface and an opposed surface;

a plurality of spaced, lightly doped buffer regions in said substrate for defining and electrically isolating said unit solar cells, said buffer regions formed from a material having a conductivity opposite from said substrate;

a photovoltaic region in each said unit solar cell across a portion of said light receiving surface of each said unit solar cell and overlapping one of said buffer regions defining said unit solar cell for electrical contact therewith, said photovoltaic region formed from a material having the same conductivity type but higher dopant concentration than said buffer regions; and

metal electrical contacts disposed on a surface of said substrate for electrically connecting said unit solar cells in series fashion.

13. A method of forming a solar battery including a plurality of P-N junction unit solar cells on a substrate formed from a semiconductive material comprising:

forming a plurality of spaced, lightly doped buffer regions of a material having a conductivity type opposed that of said substrate for defining said unit solar cells;

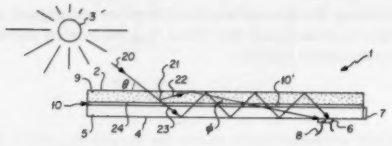
forming a photovoltaic region in each unit solar cell on a portion of the light receiving surface of said substrate, said photovoltaic region being of a material having the same conductivity as said buffer regions but higher dopant concentration and overlapping one of said buffer regions defining said unit solar cell for electrical contact between said photovoltaic region and said buffer region; and

forming metal electrical contacts between said unit solar cells for electrically connecting said unit solar cells in series fashion.

4,144,097
LUMINESCENT SOLAR COLLECTOR

Robert R. Chambers, Studio City, and Peter G. Wohlmut, Palo Alto, both of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 19, 1978, Ser. No. 897,630
Int. Cl.² H01L *31/04*
U.S. Cl. 136—89 PC **15 Claims**



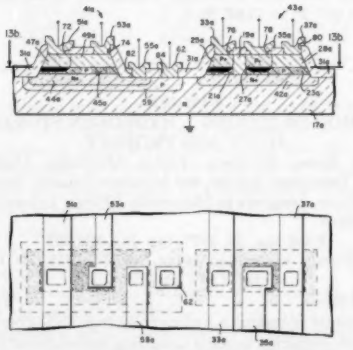
1. A luminescent solar collector comprising a light transmitting member which carries at least one photovoltaic means, a luminescent member removably attached to said light transmitting member, a fluid interface material between said members, said interface material essentially filling any space between said light transmitting member and said luminescent member, said interface material being essentially transparent and nonabsorbing to light and having an index of refraction relative to the index of refraction of said light transmitting member and said luminescent member such that light will readily pass from one member to the other member through said interface material, and said interface material being supplemented with a solid, conforming material.

9. In a method for increasing the efficiency of a luminescent solar collector, said collector containing a luminescent member whose luminescent agents have lost a portion of their original efficiency, the improvement comprising attaching to said lower efficiency luminescent member a higher efficiency luminescent member with a fluid interface material between said members, said interface material being essentially transparent and nonabsorbing to light and having an index of refraction relative to the index of refraction of said luminescent members such that light will readily pass from one member to the other member through said interface material.

4,144,098
P⁺ BURIED LAYER FOR I²L ISOLATION BY ION IMPLANTATION

Bruce B. Roesner, Tustin, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 28, 1977, Ser. No. 791,912
Int. Cl.² H01L *27/04, 21/265, 21/22, 29/72*
U.S. Cl. 148—1.5 **8 Claims**



5. In a method of fabricating an integrated circuit the steps of:

a. driving into first and second spaced apart regions in the surface of an N-type silicon body, an N conductivity dopant to create first and second N-type regions therein;

b. driving into said surface a P-type dopant in selected areas to create a first P-type region entirely within said first N-type region and second and third spaced apart P-type regions entirely within said second N-type region;

c. implanting a P-type dopant into said surface over an area which includes, and extends beyond all sides of, said first N doped region;

d. growing an N-type epitaxial silicon layer on said surface, and auto-doping P-type dopant from said first, second and third P-type regions to form corresponding first, second and third buried P-type regions in said epitaxial layer;

e. forming additional doped regions in said epitaxial layer to create separate vertical transistors whose emitters comprise said first and second N-type regions and whose bases comprise said first and third buried P-type regions, and isolating said transistors each from the other;

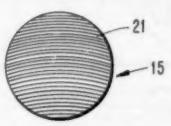
f. making contact with said first N-type region through the surface of said silicon body; and

g. making contact with said second N-type region through said silicon body.

4,144,099
HIGH PERFORMANCE SILICON WAFER AND FABRICATION PROCESS

Harold D. Edmonds, Hopewell Junction, and Gary Markovits, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1977, Ser. No. 847,383
Int. Cl.² H01L *21/322, 21/324*
U.S. Cl. 148—1.5 **12 Claims**



10. A process for making a high performance silicon semiconductor wafer with built in gettering prior to device fabrication comprising the steps of:

(1) shaping the wafer to form two flat parallel surfaces,

(2) chemically treating the wafer to remove damage resulting from said shaping,

(3) grinding a layer of damage having a depth of about 8–35 microns in only one of said surfaces with a rotating abrasive means,

(4) heating the wafer, after grinding in an inert atmosphere from a time and temperature sufficient to getter impurities and relieve stresses caused by said grinding and quenching said wafer after heating,

(5) polishing only the other surface after said heating and quenching and

(6) simultaneously free polishing both surfaces to remove cavities from the damaged surface while retaining a residual layer of crystallographic damage for gettering during device fabrication.

4,144,100
METHOD OF LOW DOSE PHOSHORUS IMPLANTATION FOR OXIDE PASSIVATED DIODES IN <100> P-TYPE SILICON

Bernard A. MacIver, Lathrup Village, and Eugene Greenstein, Southfield, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 2, 1977, Ser. No. 856,643
Int. Cl.² H01L *21/265, 7/54*
U.S. Cl. 148—1.5 **6 Claims**

5. In a method of making a low leakage, oxide passivated PN

junction by low dosage ion implantation of phosphorus in a P-type region on a <100> face of a silicon monocrystal, which implantation is in a dosage below about 1×10^{15} phosphorus ions per square centimeter, the improvement wherein after phosphorus implantation and prior to anneal, the phosphorus implanted region is connected to amorphous silicon by also implanting therein at least one ion selected from the group consisting of fluorine ions and chlorine ions in a dose equivalent to at least about 3×10^{15} fluorine ions per square centimeter at a rate of 1 microampere per square centimeter, whereby a low leakage PN junction can be simultaneously produced and oxide passivated upon implantation anneal in a moist oxygen atmosphere, and then annealing said region in a moist oxygen atmosphere at a temperature of about 1000°-1200° C. for 1-5 hours to concurrently form said low leakage PN junction by annealing said region and grow a passivating silicon dioxide coating at least about 3000 angstroms thick over said PN junction.

4,144,101

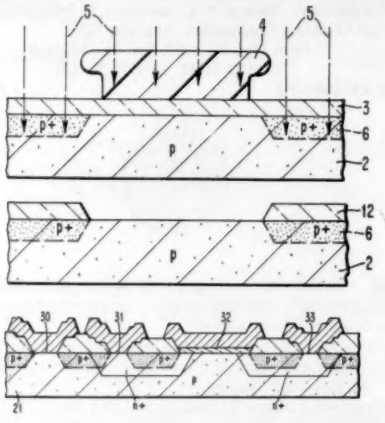
PROCESS FOR PROVIDING SELF-ALIGNED DOPING REGIONS BY ION-IMPLANTATION AND LIFT-OFF

Vincent L. Rideout, Mohegan Lake, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 5, 1978, Ser. No. 912,797

Int. Cl.[2] **H01L** *21/265, 21/28, 29/78;* **B01J** *17/00*

U.S. Cl. 148—1.5 **17 Claims**



1. A process for providing ion-implanted regions in a semiconductive substrate beneath preselected regions of an existing layer on said substrate and self-aligned to preselected subsequently fabricated regions of said layer which comprises:

A. providing a semiconductive substrate;

B. providing a first layer of a material above said substrate, beneath preselected portion of which is to be subsequently formed said ion-implanted regions;

C. providing a resist mask above said layer wherein the sidewalls of said resist mask are perpendicular to the upper surface of the substrate or are undercut;

D. ion-implanting impurities through said layer in those regions not covered by said resist mask, to provide ion-implanted regions beneath said first layer; the relative thickness of said layer and the combined layer and resist mask being such that the resist mask and portion of said layer beneath it are sufficiently thick so as to prevent ions from penetrating therethrough;

E. depositing by sputtering or evaporating a layer of lift-off material on said first layer and said resist layer wherein the thickness of said layer of lift-off material is less than the thickness of said resist to a sufficient extent that no lift-off material is deposited on the sidewalls of said resist and a gap is formed between the resist layer and the portion of the lift-off material which is above said first layer but not above said resist layer;

F. removing said resist layer by dissolving and thereby also removing along with said resist layer, said layer of lift-off material which was deposited on said resist layer;

G. removing that portion of said first layer which was beneath said resist layer;

H. removing said layer of lift-off material from above said first layer; and

I. obtaining thereby ion-implanted regions self-aligned at the edges to preselected fabricated regions located above the ion-implanted regions.

4,144,102

PRODUCTION OF LOW EXPANSION SUPERALLOY PRODUCTS

Darrell F. Smith, Jr.; Edward F. Clatworthy, and Donald E. Wenschhof, Jr., all of Huntington, W. Va., assignors to The International Nickel Company, Inc., New York, N.Y.

Division of Ser. No. 703,528, Jul. 8, 1976, Pat. No. 4,066,447.

This application Aug. 15, 1977, Ser. No. 824,810

Int. Cl.[2] **C21D** *7/14;* **C22F** *1/10;* **C22C** *38/06, 38/48*

U.S. Cl. 148—2 **5 Claims**

1. A process for preparing a precipitation-hardened wrought product comprising establishing a melt of an alloy consisting essentially of 30% to 57% nickel, 1.7% to 8.3% chromium, 1% to 2% titanium, metal from the group columbium, tantalum and mixtures thereof in proportions providing the total percentage of columbium plus one-half the percentage of tantalum is 1.5% to 5%, up to 31% cobalt, up to 1.5% aluminum, up to 0.2% carbon, up to about 2% manganese, up to about 1% silicon, up to 0.03% boron and balance essentially iron in an amount of at least 34% of the alloy and having the composition proportioned in accordance with the following four relationships A, B, C' and D' whereby:

(A) %Ni + 0.88(%Co) − 1.70(%Al) − 2.01(%Ti) + 0.26(%Mn + Cr) equal up to 51.8

(B) %Ni + 1.13(%Co) − 2.60(%Al) − 1.47(%Ti) − 1.93(%Mn) − 2.51(%Cr) + 1.87(%Cr) at least 40.8

(C) %Al + 1.3(%Ti) + 1.44(%Cb + ½Ta) − 0.12(%Cb + ½Ta)²− 0.37 (%Cr) + 0.03 (%Cr)² at least 3.81

(D') %Al+1.3(%Ti)+0.25(%Cb+½Ta)−0)125(%Cr) up to 3.18

solidifying the alloy in a mold, separating the alloy and the mold, hot working the solidified alloy at temperature of about 2100° F. and below, and thereafter age-hardening the alloy with a heat treatment of at least 8 hours in the temperature range of 1350° F. to 1150° F.

4,144,103

METHOD OF MAKING A HYDROGEN STORAGE ALLOY AND PRODUCT

Takaharu Gamo, Fujiidera; Yoshio Moriwaki, Moriguchi; Toshio Yamashita, Katano, and Masataro Fukuda, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Sep. 26, 1977, Ser. No. 836,905

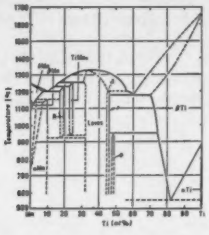
Claims priority, application Japan, Sep. 27, 1976, 51-116395

Int. Cl.[2] **C22F** *1/02*

U.S. Cl. 148—3 **6 Claims**

1. A method of making a hydrogen storage alloy comprising the steps of: preparing an alloy consisting essentially of 37 to 42 atomic percent of titanium and 58 to 63 atomic percent of manganese; heating the alloy at a high temperature below the melting temperature of the alloy under vacuum or in an inert atmosphere; and cooling the heated alloy to room temperature,

whereby a homogeneous single C-14 type Laves phase is produced.

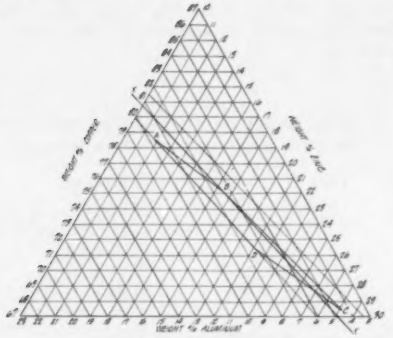


6. A hydrogen storage alloy manufactured by the method of claim 1.

4,144,104
STABLE HEAT SHRINKABLE TERNARY β-BRASS ALLOYS CONTAINING ALUMINUM

Peter L. Brooks, Palo Alto, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 668,041, Mar. 18, 1976, abandoned. This application Mar. 30, 1977, Ser. No. 783,041
Int. Cl.[2] C22F 1/08
U.S. Cl. 148—11.5 R 6 Claims



1. A ternary alloy comprised of copper, aluminum and zinc having a β-brass type structure falling within the area on a ternary diagram defined by the points:

A.	78.3% Cu	9.7% Al	12% Zn
B.	75.1% Cu	7.5% Al	17.4% Zn
C.	67% Cu	4.2% Al	28.8% Zn
D.	72.6% Cu	7.9% Al	19.5% Zn

said alloy being in its martensitic state and an M_s temperature of 0° C. or lower and having been deformed from an original configuration to render it heat recoverable, said alloy exhibiting stress stability of at least 1,000 hrs at 125°° C. when caused to recover by being warmed to a temperature at which the alloy exists in its austenitic state so that a degree of unresolved recovery remains.

4. A process for making a heat recoverable article that exhibits stress stability of at least 1,000 hours at 125° C. when allowed to recover so that a degree of unresolved recovery remains comprising the steps:

(a) selecting a ternary alloy capable of being rendered heat recoverable comprised of copper, aluminum and zinc having a β-brass type structure and having an M_s temperature of 0° C. or lower falling within the area on a ternary diagram defined by the points:

A.	78.3% Cu	9.7% Al	12% Zn
B.	75.1% Cu	7.5% Al	17.4% Zn
C.	67% Cu	4.2% Al	28.8% Zn
D.	72.6% Cu	7.9% Al	19.5% Zn

(b) fabricating said article from the selected alloy into an original, heat-stable configuration,

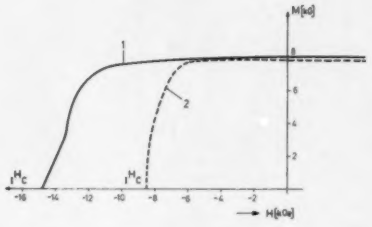
(c) cooling said article to a temperature at which the alloy exists in its martensitic state, and

(d) deforming said article to a second, heat-unstable configuration from which recovery occurs when said article is warmed to a temperature at which the alloy reverts to austenite from said martensitic state.

4,144,105
METHOD OF MAKING CERIUM MISCH-METAL/COBALT MAGNETS

Sevi Gaiffi; Anton Menth, both of Nussbaumen, and Harmut Nagel, Wettingen, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Continuation-in-part of Ser. No. 603,726, Aug. 11, 1975, abandoned. This application Sep. 9, 1976, Ser. No. 721,769
Claims priority, application Switzerland, Aug. 13, 1974, 11025/74
Int. Cl.[2] H01F 1/08
U.S. Cl. 148—103 2 Claims



1. A method of preparing a permanent magnet having improved coercive field strength and having the composition:

$$((CeMM)_{1-x}RE_x)_{1-y}Sm_yCo_{5\pm0.2}$$

wherein $0.05 < x < 0.5$, $0 \leqq y \leqq 0.25$, the CEMM has the atomic composition:

$$Ce_\alpha\ La_\beta\ Nd_\gamma\ Pr_\delta,$$

wherein

$0.45 < \alpha < 0.55$
$0.20 < \beta < 0.40$
$0.05 < \gamma < 0.15$
$0.00 < \delta < 0.05$

and $\alpha + \beta + \gamma + \delta = 1$, wherein RE consists of the alloy having the atomic composition:

$$Nd_APr_B(Ce, La, Sm)_C$$

wherein A is 0.75, B is 0.22, C is less than 0.03 and A + B + C = 1; which consists essentially of mixing 1-x parts of comminuted $CeMMCo_5$, x parts of comminuted $RECo_5$, wherein Re and CeMM are as defined previously and 10 to 14 wt.% based on the total mixture of a sintering additive consisting of 50 to 70 wt.% Sm and 50 to 30 wt.% Co;

grinding said mixture under a protective gas to a particle size in the range of 2 to 10 microns;

aligning the powder particles in a magnetic field at approximately 50 kOe;

isostatically compressing the powder to a pressed body;

sintering the body at a temperature in the range of 1035° to 1045° C.; and

heat-treating said body at a temperature above 300° C.

4,144,106

MANUFACTURE OF AN I^2L DEVICE UTILIZING STAGED SELECTIVE DIFFUSION THRU A POLYCRYSTALLINE MASK

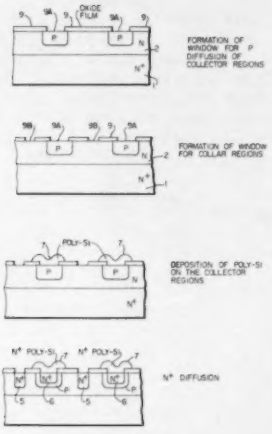
Hiromitsu Takeuchi, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 29, 1977, Ser. No. 820,319

Claims priority, application Japan, Jul. 30, 1976, 51-92575

Int. Cl.² H01L *21/20, 21/225*

U.S. Cl. 148—175 **6 Claims**


OXIDE FILM
FORMATION OF WINDOW FOR P DIFFUSION OF COLLECTOR REGIONS
FORMATION OF WINDOW FOR COLLAR REGIONS
POLY-Si
DEPOSITION OF POLY-Si ON THE COLLECTOR REGIONS
N⁺ POLY-Si
N⁺ DIFFUSION

1. A method of manufacturing an I^2L (integrated injection logic) composed of complementary transistors one serving as an injector or a source of current and the other serving as an inverter, said method comprising the steps of:

preparing an N^+substrate;

depositing an N-type epitaxial layer over the N^+substrate;

effecting P-type impurity diffusion into a region corresponding to the base of the inverter transistor and a region corresponding to the emitter of the injector transistor;

depositing polycrystal silicon in a manner to cover completely a region corresponding to the collector of the inverter transistor; and

simultaneously diffusing an N^+impurity into the collector region and a region corresponding to a collar surrounding the base region of said inverter, thereby forming the N^+collector and the N^+collar with a difference in the diffusion depth because of the existence of the polycrystal silicon in said collector region.

4,144,107

GELLED EXPLOSIVE COMPOSITIONS

George T. Colegrove, San Diego, Calif., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 10, 1978, Ser. No. 868,259

Int. Cl.² C06B *31/30*

U.S. Cl. 149—60 **11 Claims**

1. A gelled explosive containing water, at least one member selected from the group of polysaccharide colloid and synthetic polymer; a water-soluble melamine resin and a water-soluble explosive salt.

4,144,108

SUPPORT

John A. F. Gidley, Sutton Coldfield; Barry F. Irving, Aldridge, and Barry K. Johnson, Alum Rock, all of England, assignors to Imperial Metal Industries (Kynoch) Limited, Birmingham, England

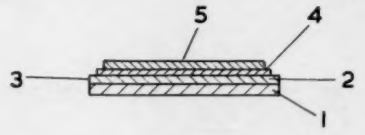
Continuation of Ser. No. 716,457, Aug. 23, 1976, abandoned.

This application Mar. 20, 1978, Ser. No. 888,390

Claims priority, application United Kingdom, Aug. 26, 1975, 35202/75

Int. Cl.² A01F *25/12*

U.S. Cl. 156—60 **5 Claims**



1. A method of supporting a sheet of ferromagnetic material having a mobile tacky layer thereon while curing or drying the tacky layer which comprises: locating the sheet of ferromagnetic material on a support, the support comprising a sheet of glass having a flat planar surface with a uniform thickness layer of permanently magnetic material thereon; maintaining the sheet of glass horizontal and level whereby the thickness of the tacky layer is maintained uniform; and passing the sheet of glass and the sheet of ferromagnetic material having the mobile tacky layer thereon through a drying oven at a temperature below the Curie point for the magnetic material to cure or dry the tacky layer.

4,144,109

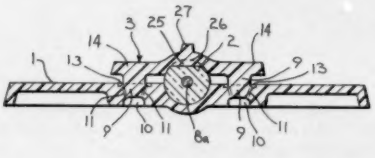
ULTRASONIC WELDING OF PLASTIC MEMBERS

Gordon J. Waligorski, South Haven, Mich., assignor to Desco Corporation, Milwaukee, Wis.

Filed Sep. 28, 1977, Ser. No. 837,536

Int. Cl.² B29C *27/08*

U.S. Cl. 156—73.1 **4 Claims**



1. In the process of producing an article having a glass tube comprising the method of clamping said glass tube to a plastic base plate comprising the steps of forming at least one clamping strap with a welding stud of a preselected diameter at each end and with an outer enlarged portion encircling each stud, forming said base plate with openings spaced to the opposite sides of the tube in accordance with the studs on said clamping strap and with an encircling recess about each opening, each of said openings having a slightly smaller diameter than said studs, centering and assembling in stacked relation in the strap overlying the glass tube with the studs aligned with and engaging the edge of said openings in said base plate, subjecting the ends of said straps and base plate to ultrasonic vibratory energy to cause said studs and edges of said openings to soften and partially melt, applying pressure across said support and said base plate to force said stud into said opening with the displacement of the softened plastic material including partial displacement outwardly of the opening into the adjacent recess to develop a generally conically configured weld interface, thereafter terminating the application of ultrasonic energy with the enlarged portions spaced from the base plate to overlay the

softened plastic and causing said softened plastic material to set and form an integral welded joint.

4,144,110

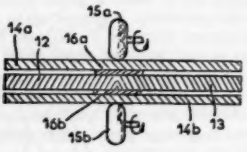
DYNAMIC FRICTION BONDING PROCESS

Jane Luc, 18 rue Fourcroy, Paris 17e (Seine), France

Continuation of Ser. No. 830,831, Jun. 5, 1969, abandoned. This application Jul. 31, 1972, Ser. No. 276,301

Int. Cl.[2] **B29C** *27/08;* **B32B** *31/16*

U.S. Cl. 156—73.5 **9 Claims**



1. A process for improving the properties of a predetermined portion of a non-resin material in the solid state by which the material is enabled to bond to another substance, the non-resin solid state material being a material selected from the group consisting essentially of metals and ceramics and having a plurality of surfaces, a surface of the solid state material which is adjacent the predetermined portion having improved bonding properties in response to the process, the process comprising the step of:

treating adjacent the predetermined portion of solid state material with dynamic friction either:

(i) the solid state material which is to have the bonding properties of at least one of its surfaces improved, the treatment of the material in the solid state occurring upon any surface of the solid state material which is out of contact with any substance to which the solid state material is intended to be bonded, or;

(ii) a layer of material which is adjacent and unbonded to any surface of the solid state material which is to have the bonding properties of at least one of its surfaces improved, the layer being adapted to transmit the effects of the dynamic friction to any surface of the solid state material which is to have its bonding properties improved, the layer remaining unbonded to the solid state material after the treating, the treatment of the layer occurring during the condition in which the solid state material is to have its bonding properties improved is out of contact with a substance with which a bond is intended to be formed; and

the treatment adjacent the predetermined portion of the solid state material with dynamic friction being carried out without any excessive abrasion of either the surface or the layer to which the dynamic friction is applied and including the application of dynamic friction produced by means of relative motion between a tool in engagement with either the surface of the solid state material or the layer of material adjacent any surface of the solid state material, said tool being applied with pressure sufficient to create, during the condition in which the tool is engaged to one of the surface and the layer, continuous reciprocal contact between the surface and the substance, the engagement of said tool and the portion of the tool applying dynamic friction being insufficient to cause excessive abrasion of either the surface or the layer with which said tool is in engagement and the surface speed of relative motion between said tool and either the surface or the layer being in a range extending upwardly from about 0.75 meters per second, the application of dynamic friction being in accordance with predetermined parameters which are necessary for the effecting of an improvement in the bonding properties of the solid state material, the improvement being effected substantially independently of the surface finish of the solid state material and without fusion of the solid state material, the parameters including the surface speed of the relative motion of, the pressure of, and the time duration of the engagement of the tool with either the solid state material or the layer, whereby the treating with dynamic friction improves the bonding properties of the non-resin solid state material.

4,144,111

METHOD FOR MANUFACTURING A RESISTANT PLASTIC PIPE

André J. Schaerer, Saengglenstrasse 22, 8122 Pfaffhausen, Switzerland

Filed Jul. 15, 1976, Ser. No. 705,673

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1975, 2534635

Int. Cl.[2] **B29C** *19/00*

U.S. Cl. 156—187 **23 Claims**

1. A method of manufacturing a composite pipe comprising:

A. extruding an inner pipe from a polyethylene or polyethylene copolymer mix at a temperature below which cross-linking takes place;

B. positioning a reinforcing jacket over the inner pipe to form a composite pipe; and

C. heat treating the composite pipe at a temperature to cause cross-linking of the inner pipe portion and adherence of the inner pipe portion to the reinforcing jacket while maintaining a positive gas pressure inside the composite pipe during at least a first phase of the heat treating when cross-linking is initiated.

4,144,112

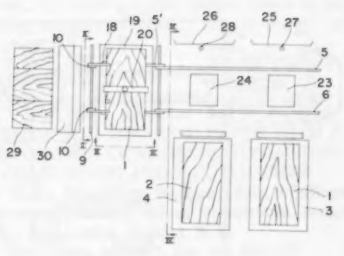
METHOD OF PILING VENEER SHEETS

Katsuji Hasegawa, Nagoya, Japan, assignor to Meinan Machinery Works, Inc., Aichi, Japan

Filed Apr. 27, 1977, Ser. No. 791,220

Int. Cl.[2] **B27D** *1/04;* **B32B** *31/04;* **B65H** *7/00*

U.S. Cl. 156—313 **4 Claims**



1. A method of piling veneer sheets comprising the steps of:

conveying a plurality of flexible veneer sheets on a plurality of vertically spaced horizontal conveyer means each conveying a veneer-sheet, the conveyer means being in vertical alignment with each other and each conveyer means having two spaced elongated veneer sheet conveyer support elements which support both lateral opposite edge portions of the veneer sheet;

stopping the advance of each veneer sheet when one edge of the sheet reaches a predetermined position in vertical alignment with the corresponding edges of the other veneer sheets; and

pressing middle portions of the veneer sheets quickly and vertically from above to lower the sheets onto a predetermined piling position which is under the plurality of conveyer means.

4,144,113
ADHESIVE COMPOSITION

Atsuo Mori, Takatsuki; Taisuke Okita, Ibaraki; Shuji Kitamura; Kozo Kotani, both of Toyonaka, and Masaaki Hama, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

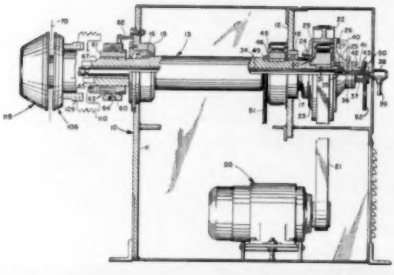
Continuation of Ser. No. 610,709, Sep. 5, 1975, abandoned. This application Jun. 17, 1977, Ser. No. 807,613
Claims priority, application Japan, Sep. 5, 1974, 49-102805
Int. Cl.[2] C08K 3/16
U.S. Cl. 156—334 7 Claims

1. In a process for adhering materials using a film adhesive, the improvement comprising using as said adhesive an adhesive composition comprising (1) a copolymer of ethylene with an ethylenically unsaturated monomer containing a carbonyl group selected from the group consisting of vinyl acetate, vinyl propionate, vinyl benzoate, methyl-, ethyl-, propyl-, butyl-, 2-ethylhexyl-, cyclohexyl-, dodecyl- or octadecyl-acrylate or methacrylate, maleic anhydride, mono- or di-methyl, ethyl-, butyl-, cyclohexyl-, 2-ethylhexyl, dodecyl-, or octadecyl-maleate, N-vinyl pyrrolidone, N-vinyl caprolactam, acrylamide, a secondary vinyl carboxylic acid amide and glycidyl methacrylate and (2) at least one of calcium chloride, magnesium chloride or a mixture thereof.

4,144,114
TIRE BUILDING MACHINE

George E. Enders, Salem, Ohio, assignor to NRM Corporation, Akron, Ohio

Filed Jul. 11, 1977, Ser. No. 814,196
Int. Cl.[2] B29H 17/26
U.S. Cl. 156—414 30 Claims

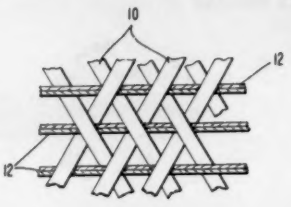


1. A second stage tire building machine comprising a housing, a main shaft journaled in and projecting from said housing in cantilever fashion, a screw shaft journaled in said main shaft at opposite ends thereof and coextensive therewith, a distal sleeve slidably mounted on said shaft, a proximal sleeve telescoped over said distal sleeve and being slidably mounted on said distal sleeve at one end and said shaft at the other end, tire bead engaging flanges on each sleeve, said screw including opposite hand threaded sections exteriorly of said housing, axial slots in said main shaft corresponding to said threaded sections of said screw, and drive means connecting the ends of said sleeves to said threaded sections to move said sleeves and thus said flanges uniformly in opposite directions upon relative rotation of said shaft and screw.

4,144,115
METHOD OF FABRICATING BATTERY ELECTRODE SHEATHS

Erik Sundberg, Yardley, Pa., assignor to Aktiebolaget Tudor, Sweden

Division of Ser. No. 720,087, Sep. 2, 1976, Pat. No. 4,048,398. This application May 25, 1977, Ser. No. 800,529
Int. Cl.[2] H01M 2/18; B32B 31/16, 31/26
U.S. Cl. 156—161 6 Claims



1. A method of forming a tubular sheath for maintaining active material in an electrode in a lead-acid storage battery comprising the steps of:

providing a sheath comprising a braid or weave of inorganic fiber threads having a plurality of spaced axial threads extending axially along the length thereof and forming crossing points with the threads of the braid or weave, said axial threads comprising a mixture of at least two thermoplastic fibers having different softening temperatures;

tensioning the braid or weave in the axial direction;

heating the tensioned braid or weave to a temperature sufficient to:

soften the thermoplastic fiber having the lower softening temperature to bond the latter to the inorganic fibers at their crossing points only; and

weaken the thermoplastic fibers having the higher softening temperature to enable the latter to be only slightly elongated during tensioning to substantially equalize stresses within said last-named fibers so that the latter are of the same length following release of the tensioning;

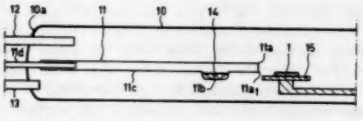
cooling the sheath; and

releasing the tensioning.

4,144,116
VAPOR DEPOSITION OF SINGLE CRYSTAL GALLIUM NITRIDE

Guy M. Jacob, Creteil, and Jean P. Hallais, Ablon, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 17, 1976, Ser. No. 667,690
Claims priority, application France, Mar. 19, 1975, 75 08612; Mar. 19, 1975, 75 08613; Mar. 19, 1975, 75 08615
Int. Cl.[2] B01J 17/32; C01B 21/06; C01G 15/00
U.S. Cl. 156—611 42 Claims



1. A method of manufacturing single crystals consisting essentially of gallium nitride comprising introducing gallium chloride and ammonia into an upstream portion of an open elongated reactor causing said gallium chloride and ammonia to react, said gallium chloride being produced in the reactor by the action of a first supply of hydrogen chloride on a quantity

of liquid gallium contained in a bulge in said reactor, in the vapor phase while in the presence of a carrier gas depositing the resultant gallium nitride on a substrate located in the reactor downstream from the point of introduction of said gallium chloride said ammonia and most of the carrier gas being introduced into a first upstream end of said reactor thereby creating an ammonia containing atmosphere which flows from said upstream end to a second downstream end of said reactor removing residual gases from the proximity of said downstream end, directing said gallium chloride produced to flow in said reactor in a direction parallel to the flow of said ammonia containing atmosphere along a route to the deposition zone separate from that of the ammonia containing atmosphere and the rate of flow of said gallium chloride containing stream is between half and five times the rate of flow of said ammonia containing atmosphere, while introducing into said reactor a second supply of free hydrogen chloride in an amount such that the partial pressure of said hydrogen chloride in the reaction and deposition zones in said reactor is from 2 to 50% of the total pressure in said reactor, said carrier gas being free of hydrogen, the total pressure within the reactor being about the order of atmospheric pressure, the partial pressure of the ammonia being more than 0.150 atmospheres, the partial pressure of the gallium chloride being less than 0.05 atmospheres, the partial pressure of the hydrogen chloride being between 0.02 and 0.4 atmospheres and the temperatures in the reaction and deposition zones being from 720° C. to 1100° C.

4,144,117

METHOD FOR PRODUCING A LITHIUM TANTALATE SINGLE CRYSTAL

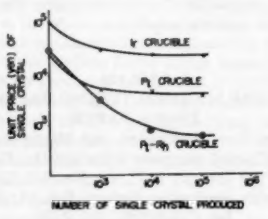
Tsuguo Fukuda, Yokohama, and Hitoshi Hirano, Kanagawa, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 10, 1977, Ser. No. 776,207

Claims priority, application Japan, Mar. 17, 1976, 51-28173

Int. Cl.[2] B01J *17/18*; C01G *35/00*

U.S. Cl. 156—617 SP **14 Claims**



1. A method for producing a lithium tantalate single crystal comprising

establishing a melt under an oxidizing atmosphere consisting essentially of lithium tantalate in a platinumrhodium crucible consisting essentially of between 80% by weight and about 70% platinum and between 20% and about 30% rhodium, said melt being at a temperature of about the melting point of lithium tantalate,

contacting a seed crystal of lithium tantalate with said melt, and

pulling the seed crystal away from the melt to grow a lithium tantalate single crystal.

4,144,118

METHOD OF PROVIDING PRINTED CIRCUITS

Fritz Stahl, Am Kehn, Fed. Rep. of Germany, assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Mar. 13, 1978, Ser. No. 885,648

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1977, 2713393

Int. Cl.[2] C23F *1/02*

U.S. Cl. 156—659 **12 Claims**

1. In a method of preparing a printed circuit board comprising the steps of chemically catalyzing the surface of an insulating material for the electroless deposition of metal, electrolessly deposited a layer of copper on said catalyzed surface, providing a layer of masking material on selected areas of the electrolessly deposited copper layer to leave an area of exposed copper in a desired pattern of conductor lines, building up an additional layer of copper on said exposed areas by electrolytic deposition, removing the layer of masking material and etching away the layer of electrolessly deposited copper from the previously masked areas, the improvement which comprises:

(a) before removing said masking material, forming an etch-resistant protective layer of oxide on the surface of the exposed layer of electrolytically deposited copper;

(b) removing said masking material from the layer of electrolessly deposited copper; and

(c) etching away the electrolessly deposited copper from the previously masked areas, to provide a printed circuit board having the desired surface pattern of conductor lines with an etch-resistant protective oxide layer thereon.

4,144,119

ETCHANT AND PROCESS

Oleh B. Dutkewych, 54 Highland Ave., Maplewood, N.J. 07040; Charles A. Gaputis, 423 Maple Blvd., Apt. 3W, Kansas City, Mo. 64124; Michael Gulla, 24 Ivy La., Sherborn, Mass. 01770, and Leonard R. Levy, 6 Colonial Dr., Framingham, Mass. 01701

Filed Sep. 30, 1977, Ser. No. 822,003

Int. Cl.[2] C23F *1/02*

U.S. Cl. 156—659 **12 Claims**

1. A sulfuric acid etchant activated with an oxidant combination of hydrogen peroxide and molybdenum, the hydrogen peroxide being present in an amount sufficient to oxidize the molybdenum and provide sustained etching and the molybdenum being present in an amount sufficient to exalt the etch rate to a rate in excess of that achievable by the peroxide alone, said etchant being characterized by the inclusion of phosphate ions in an amount sufficient to inhibit the attack of the etchant on tin.

5. A process for etching copper metals coated in part with tin comprising the step of contact of said copper with the etchant of claim 1.

4,144,120

METHOD FOR TREATING PAPER WITH A COMPOSITION CONTAINING HYDANTOIN COMPOUNDS AND A COPOLYMER

Sameer H. Eldin, Birsfelden; Wolfgang Seiz, Pfeffingen, and Ewald Forster, Allschwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 14, 1977, Ser. No. 806,425

Claims priority, application Switzerland, Jun. 25, 1976, 8159/76

Int. Cl.[2] D21H *1/48*

U.S. Cl. 162—136 **7 Claims**

1. A process for the surface treatment of paper, comprising the steps of impregnating the paper, in an amount sufficient to impart improved wet strength to the paper, with an aqueous solution of a composition which contains (a) at least one water-soluble hydantoin which contains two or more glycidyl groups and (b) at least one water-soluble copolymer, which is optionally in the form of a salt, of maleic acid or a maleic acid derivative and at least one further ethylenically unsaturated copolymerisable comonomer with 2 to 20 carbon atoms, wherein the weight ratio of component (b) to component (a) is 2.5:1 to 1:1, squeezing off the impregnated paper, drying the impregnated paper, and then subjecting the dried paper to a heat treatment at elevated temperature.

4,144,121
METHOD FOR PRODUCING ASBESTOS-FREE CALCIUM SILICATE BOARD AND THE BOARD PRODUCED THEREBY

Takashi Otouma, Yokohama; Hiroshi Asaumi, Kamakura; Kazuo Kubota, Yokosuka, and Mitsuo Yamamoto, Yokohama, all of Japan, assignors to Nippon Asbestos Co., Ltd., Japan

Filed May 3, 1977, Ser. No. 793,358
Claims priority, application Japan, May 10, 1976, 51-53016
Int. Cl.[2] D21H *5/18*; C04B *7/34*
U.S. Cl. 162—145 3 Claims

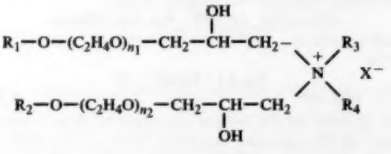
1. A method for making an asbestos-free calcium silicate board, which comprises (a) preparing a slurry of a mixture of 20–50% of silicic acid material, 20–50% of lime material, 10–40% of fibrous wollastonite, 2–10% of pulp selected from the group consisting of N-BKP, N-UKP, flax pulp and waste paper and 1–30% of calcium silicate crystals prepared by hydrothermal synthesis, with water; (b) forming the slurry into a raw board; (c) steaming the raw board; and then (d) drying, all of the said percentages being based on the weight of the total solids content.

4,144,122
QUATERNARY AMMONIUM COMPOUNDS AND TREATMENT OF CELLULOSE PULP AND PAPER THEREWITH

Jan G. Emanuelsson, and Svante L. Wahlen, both of Stenungsund, Sweden, assignors to Berol Kemi AB, Stenungsund, Sweden

Continuation-in-part of Ser. No. 734,798, Oct. 22, 1976, abandoned, and a continuation-in-part of Ser. No. 515,738, Oct. 17, 1974, abandoned, which is a continuation of Ser. No. 306,250, Nov. 10, 1972, abandoned. This application Nov. 29, 1977, Ser. No. 855,587
Int. Cl.[2] D21D *3/00*
U.S. Cl. 162—158 13 Claims

1. A process for treating cellulose pulp fibers to reduce inter-fiber bonding and impart a low degree of mechanical strength to webs formed therefrom, while at the same time preserving good hydrophilic properties, which comprises adding to a cellulose pulp fiber slurry prior to or during formation of the slurry into a web, a quaternary ammonium compound having the general formula:



wherein:

R_1 and R_2 are aliphatic hydrocarbon groups having from about eight to about twenty-two carbon atoms;

R_3 and R_4 are selected from the group consisting of methyl, ethyl and hydroxyethyl;

n_1 and n_2 are numbers within the range from about 2 to about 10; and

X is a salt-forming anion; forming and drying said web having a low degree of mechanical strength and good hydrophilic properties.

4,144,123
INCORPORATING A CROSSLINKED POLYAMIDOAMINE CONDENSATION PRODUCT INTO PAPER-MAKING PULP

Emil Scharf; Rolf Fikentscher, both of Ludwigshafen; Werner Auhorn, Frankenthal, and Werner Streit, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 740,417, Nov. 10, 1976, abandoned, which is a continuation of Ser. No. 593,628, Jul. 7, 1975, abandoned. This application Apr. 25, 1978, Ser. No. 899,824
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1974, 2434816
Int. Cl.[2] D21D *3/00*
U.S. Cl. 162—164 R 1 Claim

1. A process for manufacture of paper, which comprises adding to an aqueous suspension of cellulosic fibers for making paper sheet as a drainage and/or retention aid, from about 0.01 to 0.3% by weight, based on the weight of dry pulp, of a water-soluble crosslinked reaction product obtained by reacting

(a) 1 part by weight of an ethyleneimine-grafted polyamidoamine obtained by condensing 1 mole of a dicarboxylic acid having from 4 to 10 carbon atoms with from 0.8 to 1.4 moles of polyalkylene polyamine having from 3 to 10 alkyleneimine units, followed by grafting of from 2 to 8 ethyleneimine units per basic nitrogen atom onto the resulting polyamidoamine, with

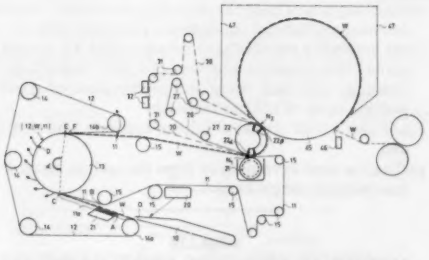
(b) from 0.3 to 2 parts by weight of a reaction product obtained by reacting a polyalkylene oxide having from 8 to 100 alkylene oxide units with epichlorohydrin in the presence of a Lewis acid, so that from 1.0 to 1.5 moles of epichlorohydrin are present per equivalent of hydroxyl groups in the polyalkylene oxide,

at a temperature of from 20° to 100° C. in aqueous solution or in a solution in water and a water-soluble organic solvent, the solution having a solids content of from 5 to 50% by weight, the reaction being carried to a point at which the viscosity of an aqueous solution containing 20% of the auxiliary is from 300 to 2,500 centipoises (20° C.), and thereafter forming a paper sheet from said aqueous suspension.

4,144,124
MACHINE FOR MANUFACTURING PAPER SUCH AS TISSUE PAPER

Risto Turunen; Pertti Soikkanen, and Martti Koponen, all of Jyväskylä, Finland, assignors to Valmet Oy, Finland

Filed Oct. 25, 1977, Ser. No. 845,037
Claims priority, application Finland, Feb. 24, 1977, 770610
Int. Cl.[2] D21F *2/00, 9/00*
U.S. Cl. 162—290 10 Claims



1. In a paper-manufacturing machine, twin wire former means including a rotary, smooth surfaced forming roll means and inner and outer endless fabric means lapped around said forming roll means with said inner endless fabric means being situated at said forming roll means between the latter and said outer endless fabric means for carrying out twin-wire web formation between said inner and outer fabric means where

they are lapped around said forming roll means, each of said endless fabric means having an inner surface defining a closed loop and an outer surface directed away from said closed loop with twin-wire web formation taking place between said outer surfaces of said endless fabric means where the latter are lapped around said forming roll means, said inner and outer endless fabric means defining between said outer surfaces thereof where said inner and outer fabric means approach said forming roll means a converging space leading toward a starting end of a common path of travel of said inner and outer endless fabric means around said forming roll means where twin-wire web formation is initiated, and one of said endless fabric means having at said converging space an upwardly directed outer surface, headbox means for depositing pulp stock on the latter upwardly directed outer surface for providing for single-wire web formation on the latter upwardly directed outer surface prior to twin-wire web formation whereby an initial dewatering action takes place during the single-wire web formation prior to further dewatering during the twin-wire web formation, said outer surfaces of said inner and outer endless fabric means defining between themselves a diverging space where said inner and outer endless fabric means travel away from said smooth surfaced forming roll means from a location where said inner and outer fabric means travel apart from each other at the end of the twin-wire formation where the end of the lapping of said forming roll means by said inner and outer endless fabric means is situated, and one of said endless fabric means having at said diverging space an upwardly directed outer surface on which the web formed during twin-wire formation rests while travelling beyond said smooth surfaced forming roll means, a press section including an inner press roll situated within the loop of that one of said endless fabric means which carries the web beyond said forming roll means and engaging the latter endless fabric means, said press section including an outer press roll situated at the outside of the latter loop and cooperating with said inner press roll to define therewith the first nip of the press section, said one of said endless fabric means which carries the web beyond said forming roll means comprising means for transporting said web from said smooth surfaced forming roll means substantially horizontally along a substantially straight path to said first press nip in the absence of the application of any suction means, pick-up means or additional dewatering means to said web, and additional endless fabric means lapped around said outer press roll for providing for the web at said first press nip a path of travel between said additional endless fabric means and the endless fabric means engaging said inner press roll, said web travelling beyond said first nip with said additional endless fabric means around said outer press roll to become detached from said endless fabric means which carries the web beyond said forming roll means only after said first press nip of said press section, and a drying section including at least one rotary drying cylinder cooperating with said outer press roll for defining with the latter at least a second press nip where the web is detached from said additional endless fabric means to travel around said drying cylinder in said drying section.

4,144,125

RUPTURE PROTECTION DEVICE FOR HOLLOW CYLINDRICAL MEMBERS SUCH AS PIPES, AND PARTICULARLY FOR PIPES OF NUCLEAR REACTORS CARRYING PRIMARY COOLANT

Franz Maritsch, Erlangen, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim, Fed. Rep. of Germany

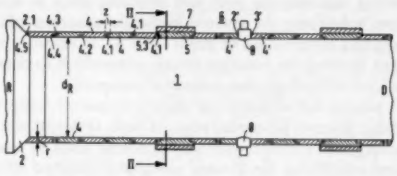
Filed Sep. 22, 1976, Ser. No. 725,524

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1975, 2542807

Int. Cl.² G21C *9/00*; F16L *9/04*

U.S. Cl. 176—38 **8 Claims**

1. Rupture protection device for hollow cylindrical members having, in installed condition thereof, respective projections at the axial ends thereof protruding beyond the diameter thereof and forming axial stops comprising a plurality of continuous rings serially connectible to one another in axial direction of a hollow cylindrical member and slidable onto the hollow cylindrical member together with at least one divided filler ring so as to form a closed ring unit covering the hollow cylindrical member, said rings being formed with respective overlapping zones at adjoining end face regions thereof constituting respective encircling projections and recesses complementary thereto in mutual engagement and respectively overlying and underlying one another, said filler ring being discontinuous and at least bipartite and being formed with both end face regions thereof having encircling projections overlying respective recesses formed in the rings adjoining said filler ring so as to facilitate insertion and removal of the parts of said filler ring radially on a hollow cylindrical member, and a locking ring axially slideable on said ring unit including said filler ring for securing the parts of said filler ring in installed condition thereof on a hollow cylindrical member, said locking ring being seatingly mounted with matching fit on the outer periphery of said filler ring.



4,144,126

CELL CULTURE METHOD

Colin Burbidge, Crawley, England, assignor to Beecham Group Limited, Great Britain

Continuation-in-part of Ser. No. 686,097, May 13, 1976, abandoned. This application Aug. 22, 1977, Ser. No. 826,761

Claims priority, application United Kingdom, May 21, 1975, 21998/75

Int. Cl.² C12K *7/00, 9/00*

U.S. Cl. 195—1.1 **16 Claims**

1. In a method for culturing animal cells in a monolayer supported on the surface of a solid porous matrix the improvement comprising contacting said cells with a film of liquid nutrient medium derived from the breakdown of a foam which is generated from said nutrient medium and a gas leaving gas in interstitial spaces.

11. In a method for producing interferon in vitro, the improvement which comprises contacting a monolayer of mammalian cells supported on the surface of a solid porous matrix with a liquid medium containing an interferon inducing substance, said liquid medium being in the form of a film derived from the breakdown of a foam generated from said liquid medium and a gas leaving gas in the interstitial spaces; and thereafter separating the interferon.

15. In a method for the preparation of a virus in vitro the improvement which comprises contacting a monolayer of animal cells supported on the surface of a solid porous matrix with a liquid medium containing an infective virus, said liquid medium being in the form of a film derived from the breakdown of a foam generated from said liquid medium and a gas leaving gas in the interstitial spaces; and thereafter separating the virus.

4,144,127

PROCESS FOR IMMOBILIZING GLUCOSE ISOMERASE

Shigehiro Enokizono, Ageo, and Soichiro Ushiro, Kokubunji, both of Japan, assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Mar. 23, 1977, Ser. No. 780,374
Claims priority, application Japan, Apr. 2, 1976, 51-36179
Int. Cl.[2] C07G 7/02; C12D 13/02
U.S. Cl. 195—63 8 Claims

1. A process for immobilizing glucose isomerase comprising adsorbing glucose isomerase enzyme onto colloidal silica by contacting said enzyme with said colloidal silica in aqueous medium, solidifying the glucose isomerase adsorbed silica by freezing at a temperature of about −10° C. to about −30° C. and then thawing the resultant frozen composition to obtain an active immobilized glucose isomerase composite.

3. A process for immobilizing glucose isomerase comprising, adsorbing glucose isomerase enzyme onto colloidal silica by contacting said enzyme with said colloidal silica in aqueous medium, solidifying the glucose isomerase adsorbed silica by freezing and then thawing the resultant frozen composition to obtain an active immobilized glucose isomerase composite in the form of granules or flakes having a particle size of 20 to 100 mesh.

7. An immobilized active enzyme produced by the process of claim 3.

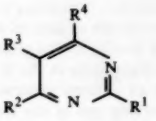
4,144,128

POLYMERIC CARRIER BOUND LIGANDS

Dietrich Hildebrand, Odenthal, Fed. Rep. of Germany, and Thomas Gribnau, Nijmegen, Netherlands, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 29, 1977, Ser. No. 792,297
Claims priority, application Fed. Rep. of Germany, May 3, 1976, 2619451
Int. Cl.[2] C07G 7/02
U.S. Cl. 195—63 13 Claims

1. In a process for bonding a ligand to a carrier by reacting the ligand with the carrier after a suitable activation step, the ligand and the carrier each containing at least one functional group selected from the group consisting of OH, NH_2, NHR^5, $CONH_2$, $CONHR^5$ and SH, the improvement which comprises activating the carrier or the ligand with a pyrimidine derivative of the formula



in which

R^1, R^2, R^3 and R^4 are each independently hydrogen, hydroxyl, halogen, lower alkyl, lower alkoxy, loweralkylthio, loweracylamino, nitro, cyano, carboxamido, loweralkylsulphonyl, loweralkoxycarbonyl, phenyl, trifluoromethyl or chloromethyl, provided that at least two of R^1 to R^4 are halogen;

prior to the bonding reaction.

4,144,129

CHOLESTEROLOXIDASE AND METHOD FOR ITS PRODUCTION FROM MICROORGANISMS

Wolfgang Gruber, Garatshausen; Hans U. Bergmeyer, Tutzing; Michael Nelböck-Hochstetter, Tutzing; Klaus Beaucamp, Tutzing; Günter Holz, Tutzing; Johanna Gramsall, Tutzing, and Günter Lang, Tutzing, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed May 15, 1973, Ser. No. 360,490
Claims priority, application Fed. Rep. of Germany, May 17, 1972, 2224131; May 17, 1972, 2224133; Feb. 15, 1973, 2307518
Int. Cl.[2] C07G 7/028
U.S. Cl. 195—66 R 19 Claims

1. Process for the preparation of cholesteroloxidase, which process comprises culturing a cholesterol-converting microorganism, disintegrating the culture and extracting same with a buffer solution containing a non-ionic surfactant, by means of destruction of the cell walls, and isolating cholesteroloxidase from the extract.

4,144,130

PROCESS FOR THE SEPARATION OF ENZYMES

Maria-Regina Kula; Karl-Heinz Kroner, both of Wolfenbüttel; Wolfgang Stach, Salzgitter-Barum; Helmut Hustedt, Meine, all of Fed. Rep. of Germany; Andija Đureković, Zagreb, and Stefica Grandja, Sesvete, both of Yugoslavia, assignors to Gesellschaft für Biotechnologische Forschung, Braunschweig-Stockheim, Fed. Rep. of Germany

Filed Apr. 14, 1977, Ser. No. 787,312
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1976, 2616584; Aug. 31, 1976, 2639129
Int. Cl.[2] C07G 7/028
U.S. Cl. 195—66 R 37 Claims

1. A process for the separation of enzymes from cell fragments or intact cells wherein the enzymes are solubilized, the system resulting after said enzyme solubilization which contains the enzymes, insoluble components and cell liquid is fed into an aqueous multiphase system

(a) containing one high molecular weight compound of the group consisting of unsubstituted or substituted polyalcohols, polyethers, polyesters, polyvinylpyrroldones and polysaccharides and at least one inorganic salt, or

(b) containing at least two high molecular weight compounds of the group consisting of unsubstituted or substituted polyalcohols, polyethers, polyesters, polyvinylpyrrolidones and polysaccharides, separating the phases from each other, separating the enzymes from the high molecular weight compounds and, if desired, isolating the enzymes.

4,144,131

IMMOBILIZATION OF ENZYMES ON HUMAN TISSUE OR ERYTHROCYTES

Thomas Richardson, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed May 23, 1974, Ser. No. 472,588
Int. Cl.[2] C07G 7/02
U.S. Cl. 195—68 8 Claims

1. A method for immobilizing an enzyme on tissue or erythrocytes comprising the steps of reacting the enzyme having nucleophilic groups selected from the group consisting of amino, carboxyl and tyrosine groups with a compound containing an electrophilic group selected from the group consisting of α, β unsaturated carbonyls, alkyl halides, and thiol to form an enzyme derivative, and then immobilizing the enzyme on the tissue or erythrocyte having nucleophilic groups selected from the group consisting of sulfhydryl, amino, imidazole, carboxylato and tyrosine groups by a coupling reaction between electrophilic groups of the derivative and nucleophilic groups in the tissue or erythrocyte.

4,144,132

PRODUCTION OF SINGLE-CELL PROTEIN FROM POTATO PROCESSING WASTE

Kent K. Lines, 3500 Blysworth Ct., Apt. N, Winston-Salem, N.C. 27106

Filed Aug. 11, 1977, Ser. No. 823,673
Int. Cl.[2] 426 *53;* A23J *1/16, 1/18*
U.S. Cl. 195—82 13 Claims

1. A method for producing single-cell protein comprising the steps of:

providing as a growth medium consisting essentially of an aqueous suspension of a filter cake waste product of potato processing, said filter cake consisting essentially of a semi-solid gel-like mass of particulate potato material and peels removed by a screening process in a potato processing plant;

preparing a fermentation mixture consisting essentially of said growth medium, a pre-fermenting yeast capable of producing amylase for breaking down starch in the growth medium to glucose, and a primary fermenting yeast capable of utilizing such glucose to support its growth; and

growing both the pre-fermenting yeast and the primary fermenting yeast in said fermentation mixture.

4,144,133

FUNGAL GROWTH MEDIA

Gordon L. Dorn, Dallas, and Geoffrey A. Land, Denton, both of Tex., assignors to J. K. and Susie L. Wadley Research Institute and Blood Bank, Dallas, Tex.

Filed Aug. 25, 1977, Ser. No. 827,573
Int. Cl.[2] C12K *1/06*
U.S. Cl. 195—100 16 Claims

1. A fungal growth medium comprising oxgall, purified saponin which is nontoxic to microbial pathogens, and a substrate for phenol oxidase in combination with a supporting agent therefore.

4,144,134

METHOD FOR DETECTION OF BACTERIAL CONCENTRATION BY LUMINESCENCE

Plakas, Chris J., Alexandria, Va., assignor to Vitatect Corp., Alexandria, Va.

Filed Jan. 31, 1977, Ser. No. 764,180
Int. Cl.[2] C12K *1/04*
U.S. Cl. 195—103.5 M 13 Claims

1. A method for detecting the presence of microbial cells in a sample comprising a mixture of microbial cells and non-microbial cells comprising the steps of:

(A) combining the sample with an enzyme which ruptures the walls of the non-microbial cells to extract non-microbial reactive material contained therein,

(B) removing the non-microbial reactive material extracted from the non-microbial cells by filtering said sample on a filter surface to eliminate the non-microbial reactive material from non-microbial cells and to produce a residue on the filter surface containing microbial cells,

(C) rupturing the walls of the microbial cells on the filter surface to extract and retain microbial reactive material contained therein on the filter surface,

(D) combining on the filter surface the microbial reactive material with a luminescence-causing reagent to generate light as a function of the amount of reactive material thus combined, and

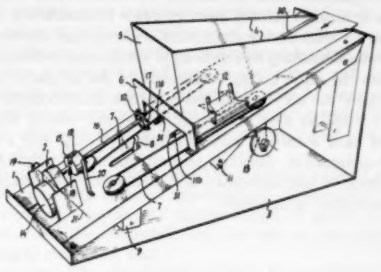
(E) detecting the amount of light thus generated on the filter surface.

4,144,135

SPREADER DEVICE AND METHOD OF SPREADING INOCULANT

Peter J. L. Sequeira, Wilmslow, England, assignor to MPJ Developments Limited, London, England

Filed Jul. 20, 1977, Ser. No. 817,273
Claims priority, application United Kingdom, Jul. 31, 1976, 32036/76
Int. Cl.[2] C12B *1/02;* C12K *1/04*
U.S. Cl. 195—120 15 Claims



1. Apparatus for spreading a culture plate with inoculant comprising means for feeding a culture plate to be processed to and from a processing position, a spreader at the processing position, and driving means for bringing the spreader into contact with the plate to produce a progressively more dilute inoculant trace thereon, said means for feeding comprising two spaced endless driving belts disposed on opposite sides, respectively of the culture plate feed path to the processing position and arranged for movement in opposite directions at the same or different speeds, whereby to produce translational and/or rotational movement of a culture plate disposed between them.

15. A method of producing a trace of inoculant of progressive dilution weakness on a culture plate including the steps of depositing inoculant on a plate, feeding the plate to a processing area by means of two spaced endless belts disposed on opposite sides, respectively, of the culture plate feed path to the processing position and moving in opposite directions at the same speed or different speeds so as to produce translational and/or rotational movement of the plate, bringing a spreader into contact with the plate whilst moving the plate in relation thereto to produce an inoculant trace on the plate, and removing the processed plate from the processing area to a collection point.

4,144,136

APPARATUS FOR CELLULAR CULTURE

Michel Corbeil, Laval-des-Rapides, Canada, assignor to Institut Armand-Frappier, Canada

Filed Jun. 6, 1977, Ser. No. 804,075
Int. Cl.[2] C12K *9/00*
U.S. Cl. 195—127 14 Claims

1. Apparatus for effecting cellular culture which comprises:

(a) at least one culture vessel;

(b) a plurality of discrete tubes having an opening at each end thereof disposed inside said culture vessel parallel and equi-distant to one another;

(c) means to introduce a suspension of cells in said culture vessel;

(d) means creating an aerobic condition in said culture vessel; and

(e) means to cause rotation of said culture vessel and of said tubes about an axis parallel to the longitudinal axis of said tubes.

4,144,137
METHOD FOR REMOVAL OF POLYMERIZATION INHIBITOR

Thomas Stewart, Andalusia, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

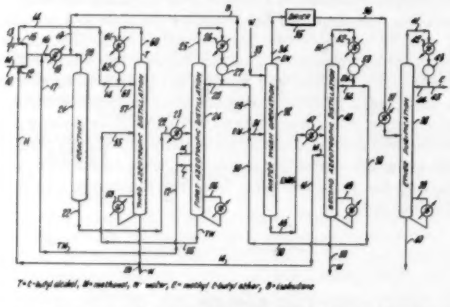
Continuation-in-part of Ser. No. 750,078, Dec. 13, 1976, abandoned. This application Jul. 21, 1977, Ser. No. 817,777
Int. Cl.[2] B01D *3/34*
U.S. Cl. 203—65 **10 Claims**

1. A process for the removal of polymerization inhibiting p-benzoquinone from an acrylic or methacrylic monomer, which comprises adding thereto, prior to distillation or in a distillation zone during distillation, a compound selected from the group consisting of mono-alkyl substituted hydroquinones wherein the alkyl group is attached to the aromatic nucleus and where the alkyl group has a carbon atom content of C_1-C_{12}, 2,5-dialkyl substituted hydroquinones where the alkyl groups have a carbon atom content of C_1-C_8, and 1,4-dihydroxynaphthalene, distilling said monomer, or continuing the distillation of said monomer, and recovering p-benzoquinone-free monomer as distillate.

4,144,138
RECOVERY OF ETHERS

Babu Y. Rao, Fishkill; Sheldon Herbstman, Spring Valley, both of N.Y., and Michael D. Riordan, Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Jan. 18, 1978, Ser. No. 870,406
Int. Cl.[2] C07C *41/12*; B01D *3/36*
U.S. Cl. 203—46 **9 Claims**



1. The process for recovering methyl t-butyl ether from a reaction effluent containing methyl t-butyl ether, methanol, t-butanol, and water which comprises:

(a) distilling said reaction effluent in a first azeotropic distillation operation thereby forming an overhead stream containing an azeotrope of methanol and methyl t-butyl ether;

(b) water-washing said azeotrope in a waterwashing operation thereby forming (i) a raffinate containing methyl t-butyl ether and (ii) an extract containing water, methanol, and methyl t-butyl ether;

(c) recovering said raffinate containing methyl t-butyl ether;

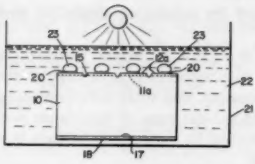
(d) distilling said extract in a second azeotropic distillation operation thereby forming (i) an overhead stream containing methanol and methyl t-butyl ether and (ii) a bottoms stream containing water;

(e) passing said overhead stream from said second azeotropic distillation operation to said water-washing operation.

4,144,139
METHOD OF PLATING BY MEANS OF LIGHT

Lawrence F. Durkee, Lovell, Me., assignor to Solarex Corporation, Rockville, Md.

Filed Nov. 30, 1977, Ser. No. 843,841
Int. Cl.[2] C25D *5/02*; H01L *31/06*
U.S. Cl. 204—15 **9 Claims**



1. A method of plating an electrical contact on a light-sensitive device displaying the photovoltaic effect, comprising providing a semiconductive wafer having at least two major surfaces, said wafer having a photovoltaic junction formed therein so that when one of said major surfaces of said wafer is exposed to light, negative charges will collect at a first of said major surfaces and positive charges will collect at a second of said major surfaces, providing a coating of a platable metal on said second major surface, positioning said wafer in a bath of an electrolyte containing positively charged ions of said platable metal, and exposing said wafer to light to create a migration of said metal from said coating into said electrolyte and thence to said negatively charged first major surface.

6. A method of selectively plating an electrical contact on a light-sensitive device displaying the photovoltaic effect, comprising providing a silicon wafer with at least two major surfaces, a first of said major surfaces being formed of a plurality of discontinuous surface segments, each of said segments having a photovoltaic junction underlying it and separate from adjacent segment junctions so that when said wafer is exposed to light, negative charges will collect at said first major surface segments and positive charges will collect at a said second major surface, positioning said wafer in a bath of electrolyte containing platable positively charged ions, and exposing said wafer to light so that said platable positively charged ions will be attracted to said negatively charged segments of said first major surface to plate said surface segments but not the discontinuities between said segments.

4,144,140
METHOD FOR THE PREPARATION OF ADDITIVES IN ORGANO-ALUMINUM ELECTROLYTE MEDIA

Richard Dötzer, Nüremberg, Hans-George Hauschildt, Erlangen, both of Fed. Rep. of Germany, and Enno Todt, deceased, late of Erlangen, Fed. Rep. of Germany by Susanne Todt, Ruth K. Todt, Ernst J. Todt, heirs, Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Division of Ser. No. 630,949, Nov. 13, 1975, Pat. No. 4,071,526. This application Jan. 27, 1978, Ser. No. 873,079
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1974, 2453829
The portion of the term of this patent subsequent to Jun. 28, 1994, has been disclaimed.
Int. Cl.[2] C25D *3/02, 3/44*
U.S. Cl. 204—14 N **1 Claim**

1. In a method for electrodepositing aluminum on the surface of a metal or conductive material in an aprotic oxygen and water-free organo-aluminum electrolyte media in the presence of a brightening additive, the improvement which comprises using as said brightening additive a product formed by adding at least one organo-aluminum compound of the general formula AlR_3, wherein R is an alkyl radical having from 1 to 4 carbon atoms, to a sulfonamide compound selected from the group consisting of o-benzoic acid sulfonimide, N-benzyolben-

zene sulfonimide, di-benzene sulfonimide, benzene-o-disulfonimide and benzene sulfonic acid amide in the presence of inert organic solvent at a temperature not exceeding 100° C., said reaction product containing an aromatic ring substituent and an alkyl group bound to aluminum.

4,144,141

AMMONIA FREE PALLADIUM DEPOSITION USING AMINOACETIC ACID

Hans-Joachim Schuster, and Klaus-Dieter Heppner, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 21, 1977, Ser. No. 863,044

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1976, 2657925

Int. Cl.² C25D *3/52*

U.S. Cl. 204—47 **4 Claims**

1. An aqueous ammonia-free bath for galvanic deposition of palladium metal containing palladium in the form of a diglycinate palladium II complex and aminoacetic acid as complexing agent, said bath being further characterized by containing:

(A) from about 1 to 50 grams per liter of dissolved palladium,

(B) from about 1 to 150 grams per liter of total added aminoacetic acid, and

(C) sufficient dissolved alkali metal hydroxide to produce a solution pH ranging from about 7 to 12.

4,144,142

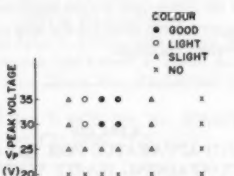
METHOD FOR PRODUCING COLORED ANODIC FILM ON ALUMINUM-BASED MATERIAL

Toshiro Takahashi; Masashi Ikegaya, and Masamichi Ozaki, all of Shizuoka, Japan, assignors to Riken Keikinzoku Kogyo Kabushiki Kaisha, Shizuoka, Japan

Continuation of Ser. No. 628,753, Nov. 4, 1975, abandoned. This application Dec. 5, 1977, Ser. No. 857,412

Int. Cl.² C25D *11/08, 11/14, 11/30*

U.S. Cl. 204—58 **2 Claims**



1. A method for producing a coloured anodic film on the surface of an aluminum material which comprises:

electroloyzing the aluminum material in a sulphuric acid electrolyte bath containing a resistivity control agent comprising from 3 to less than 5 grams per liter of water soluble, trivalent aluminum ions, by applying to the aluminum material a pulsating electric current characterized by having a current density between 2 and 8 A/ dm2, a peak voltage of 25 to 45 volts, a pulse duration of 5 to 70 m.sec., and a ratio of pulse frequency to pulse duration of between 2 and 7, wherein the aluminum material includes zinc and magnesium, the ratio of zinc to magnesium being less than 5.

4,144,143

ELECTROLYTIC PRODUCTION OF STABLE METHYL VIOLOGEN FILM

Fredrick M. Hawkridge, Richmond, Va., and Harlie L. Landrum, Hattiesburg, Miss., assignors to Virginia Commonwealth University, Richmond, Va.

Filed Oct. 25, 1977, Ser. No. 845,067

Int. Cl.² C25D *13/00;* **C25B** *3/00;* **G01N** *27/00*

U.S. Cl. 204—72 **6 Claims**

1. A method for the non-reversible electrochemical production of a stable film of 1,1'-dimethyl-4,4'-dipyridyl dichloride which is stable against a positive applied potential in an electrolytic cell and which comprises

(a) introducing an electrode comprising a plurality of wires forming a minigrid sheet into an electrolytic cell as one electrode thereof, said wires being formed by electrolytic deposition of a metal selected from the group consisting of gold, platinum, copper, nickel, a mercury/gold amalgam and alloys thereof;

(b) introducing an electrolyte solution having a pH of about 5–9 comprising dication molecules of 1,1'-dimethyl-4,4'-dipyridyl dichloride at a concentration of up to 10 millimolar into the electrolytic cell and into contact with the minigrid electrode; and

(c) subjecting the electrolyte solution to electrolysis and irreversibly forming the stable film by temporarily applying a potential in the range between the formal potential of the first reduction step of the dication molecules and the formal potential of the second reduction step of the dication molecules.

4,144,144

ELECTROLYTIC PRODUCTION OF SODIUM PERSULFATE

Kenneth J. Radimer, Little Falls, and Michael J. McCarthy, Trenton, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 753,756, Dec. 23, 1976, abandoned, and Ser. No. 753,758, Dec. 23, 1976, abandoned. This application Oct. 5, 1977, Ser. No. 839,538

Int. Cl.² C25B *1/28*

U.S. Cl. 204—82 **12 Claims**

1. A process for the direct electrolytic production of sodium peroxydisulfate with high current efficiencies in an electrolytic cell having a protected cathode comprising direct electrolysis of a neutral aqueous anolyte feed solution containing by weight initially 5 to 9% sodium ions, 12 to 30% sulfate ions, 1 to 4% ammonium ions and an effective amount of a polarizer, using a sulfuric acid solution as the cell catholyte and an electric current density of at least 0.5 amperes per square centimeter of surface of the anode.

4,144,145

PROCESS FOR RECOVERY OF REUSABLE CHROMIC ACID FROM THE WASTE CHROMIC ACID SOLUTION CONTAINING IMPURITIES

Morio Watanabe, Amagasaki, and Sanji Nishimura, Kyoto, both of Japan, assignors to Solex Research Corporation, Osaka, Japan

Filed Apr. 12, 1977, Ser. No. 786,770

Claims priority, application Japan, Apr. 15, 1976, 51-41808; Jul. 29, 1976, 51-89674; Nov. 27, 1976, 51-142499; Dec. 6, 1976, 51-145688

Int. Cl.² C25B *1/00;* **B01D** *11/00;* **C01G** *37/12, 37/14*

U.S. Cl. 204—89 **8 Claims**

1. A process for the recovery of hexavalent chromium values from an aqueous solution containing hexavalent chromium values and heavy metallic ions comprising:

(a) subjecting the aqueous solution to an electro-dialysis process wherein said aqueous solution containing the hexavalent chromium values is introduced into the cathode compartment of the process and free hexavalent chro-

mium ions are transferred into the anode compartment of the process;

(b) removing the liquid in the cathode compartment from the electro-dialysis process and adding sulfuric acid thereto in an amount at least stoichiometrically equivalent to the amount of heavy metal ions therein;

(c) extracting the hexavalent chromium values in the acidified solution by liquid-liquid extraction using an organic solvent (A) containing one or more compounds selected from the group consisting of phosphoric acid esters together with a petroleum hydrocarbon as a diluent to produce an organic phase containing hexavalent chromium values and an aqueous raffinate;

(d) extracting any remaining hexavlent chromium in said aqueous raffinate by liquid-liquid extraction with an organic extractant (B) which contains one or more compounds selected from the group consisting of primary, secondary, tertiary and quaternary amines together with a petroleum hydrocarbon as a diluent; and

(e) regenerating extractant (A) and (B) by stripping the organic phase with a stripping reagent.

8. A process for the recovery of usable chlorates from a chlorate solution containing hexavalent chromium values obtained by electro-oxidation which comprises:

(a) extracting the hexavalent chromium values in said solution by liquid-liquid contact with an organic extractant which contains one or more compounds selected from the group consisting of quaternary amines together with a petroleum hydrocarbon as a diluent; and

(b) regenerating extractant (C) by contacting it with the aqueous solution treated by said electro-oxidation process whereby the hexavalent chromium values are stripped from organic extractant (C); and

(c) recycling said stripping solution.

4,144,146
CONTINUOUS MANUFACTURE OF SODIUM DITHIONITE SOLUTIONS BY CATHODIC REDUCTION

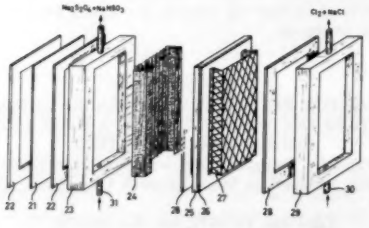
Bernd Leutner, Frankenthal; Gotthard Scizi, Bad Duerkheim; Siegmar Lukas; Siegfried Schreiner, both of Ludwigshafen, and Erfried Voelkl, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland, Pfalz, Fed. Rep. of Germany

Filed Oct. 5, 1977, Ser. No. 839,595

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1976, 2646825

Int. Cl.[2] C25B *1/00*

U.S. Cl. 204—92 **6 Claims**



1. In a process for the continuous manufacture of concentrated dithionite solutions by cathodic reduction of an aqueous circulated solution containing sulfite and/or bisulfite in the cathode chamber of an electrolysis cell, which cell comprises a cathode chamber with a cathode and an anode chamber with an anode, the chambers being separated by a cation exchanger membrane which is permselective towards the dithionite counter-ion wherein the improvement comprises: recirculating the solution at least 10 times per hour, with the proviso that the relative catholyte volume outside the cell, defined as $a = V_{total} - V_C/V_{total}$ wherein V_{total} is the total catholyte volume and V_C is the volume of the catholyte in the cathode chamber, is less than 0.9.

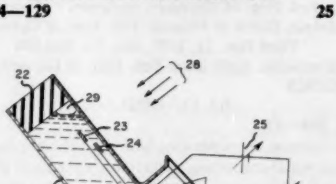
4,144,147
PHOTOLYSIS OF WATER USING RHODATE SEMICONDUCTIVE ELECTRODES

Howard S. Jarrett, Wilmington, Del.; Harold H. C. Kung, Glenview, Ill., and Arthur W. Sleight, Kennett Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 26, 1977, Ser. No. 836,839

Int. Cl.[2] C25B *1/04*; H01M *6/30*

U.S. Cl. 204—129 **25 Claims**



1. In a photoelectrochemical cell comprising an anode and a p-type semiconducting cathode the improvement wherein the said cathode comprises an oxide of trivalent rhodium.

2. A sunlight-permeable device for decomposing water into hydrogen and oxygen when filled with a sunlight-permeable aqueous electrolyte and exposed to sunlight comprising

a container permeable to sunlight

having within it an anode and a cathode so spaced that entering sunlight will impinge on both simultaneously,

the anode being a metallic conductor or an n-type semiconductor,

the cathode being a p-type semiconducting oxide of trivalent rhodium having a resistivity less than 10^5 ohm-cm, and

an external electrical circuit connecting the anode and cathode, the said circuit containing an applied voltage of zero to 1.23 volts.

17. In the process of photoelectrochemically hydrolyzing water wherein an anode and p-type semiconducting cathode are used the improvement wherein the said cathode comprises an oxide of trivalent rhodium.

4,144,148
METHOD AND APPARATUS FOR TREATING METAL CONTAINING WASTE WATERS

Roland Kammel, and Hans-Wilhelm Lieber, both of Berlin, Fed. Rep. of Germany, assignors to Gotzelmann KG, Industriebwasser-Anlagen, Fed. Rep. of Germany

Filed May 2, 1978, Ser. No. 902,261

Claims priority, application Fed. Rep. of Germany, May 3, 1977, 2719667; Dec. 22, 1977, 2757271

Int. Cl.[2] C02C *5/12*

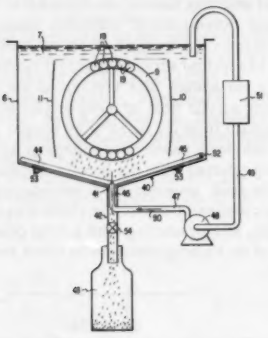
U.S. Cl. 204—149 **12 Claims**

1. Method for treating metal containing waste waters while employing a vessel containing the waste water in which there is disposed at least one anode and one cathode comprised of a plurality of electrically conductive elements and in which the waste water is subjected to electrolysis during which the cathode elements are moved, comprising:

(a) providing the cathode elements in the form of rods;

(b) arranging the rods in the vessel by means of at least two holding devices so that they extend parallel to one another

and can be moved in the holding devices relative to one another; and



(c) moving the holding devices during the electrolysis process so that the rods strike one another again and again at spaced intervals.

4,144,149

METHOD FOR WORKING UP AQUEOUS RESIDUES FROM METALLIZING BATHS

Heinz Bollhalder, Neuenhof, and Vladimir Sova, Mellingen, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Mar. 29, 1978, Ser. No. 891,223

Claims priority, application Switzerland, Apr. 6, 1977, 4344/77

Int. Cl.[2] C25C *1/12*; C02C *5/12*

U.S. Cl. 204—149 **15 Claims**

1. A method for purifying aqueous residues from exhausted metallizing baths, which contain at least one amino compound as a complex-forming agent, which comprises anodically treating the aqueous residue containing heavy metal ions and complex-forming agent at a voltage, current density and time sufficient to eliminate the complexing ability of the amino compound, and removing the heavy metal ions from said aqueous residue.

4,144,150

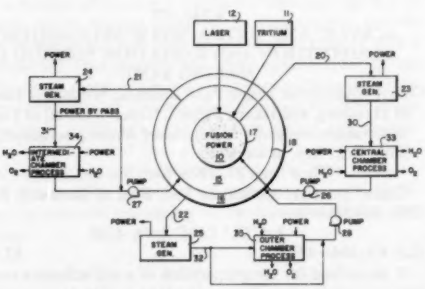
MEANS AND METHOD FOR PROCESSING CHEMICALS WITH RADIATION

Henry J. Gomberg; John G. Lewis, both of Ann Arbor; Theodor Teichmann, Plymouth, and Robert J. Teitel, Ann Arbor, all of Mich., assignors to Texas Gas Transmission Corporation, Owensboro, Ky.

Filed Sep. 2, 1975, Ser. No. 609,834

Int. Cl.[2] B01J *1/00, 1/10*

U.S. Cl. 204—157.1 H **20 Claims**



14. The method of processing chemical compounds and producing therefrom desirable output products, comprising in combination,

generating neutrons,

passing said neutrons through two adjacent closed chambers having walls transparent to the passage of said neutrons,

introducing into each chamber a chemical compound responsive to said neutrons to effect a change in the molecular structure of the compound and to produce thereby at least two distinct portions,

separating the two portions,

chemically reacting one of said portions with a further chemical compound to produce thereby a recoverable output product, and

separating said recoverable product from said chemical compounds.

4,144,151

PRODUCTION OF $B_{10}H_{14}$ FROM B_2H_6 AT ROOM TEMPERATURE BY LASER INDUCED CHEMISTRY USING DF LASER

James A. Merritt, Pulaski, Tenn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 12, 1978, Ser. No. 914,698

Int. Cl.[2] B01J *1/10*

U.S. Cl. 204—157.1 R **7 Claims**

1. A method for producing $B_{10}H_{14}$ from B_2H_6 by laser induced chemistry comprising:

i. filling one or more laser reaction cells with B_2H_6 to a predetermined pressure from about 10 to about 400 Torr;

ii. irradiating said B_2H_6 with a predetermined power level of a DF laser selected from a pulsed laser and a CW multiline laser, said irradiating accomplished over a predetermined time period from about one to about 13 seconds by employing the P_{12} (2611 cm^{-1}) frequency of the 1–0 band of said DF laser, said frequency being resonant with the ν_8 (2614 cm^{-1}) vibrational fundamental of said B_2H_6 and said frequency being that frequency that is strongly absorbed by said B_2H_6 to start a reaction which produces said $B_{10}H_{14}$ in the form of solid white crystals; and,

iii. separating said $B_{10}H_{14}$ from said laser reaction cell.

4,144,152

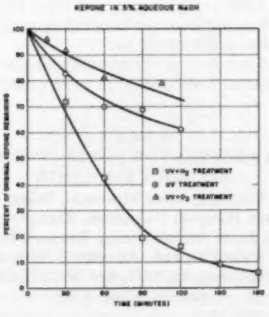
DEHALOGENATION OF HALOGENATED COMPOUNDS

Judith A. F. Kitchens, Haymarket, Va., assignor to Atlantic Research Corporation, Alexandria, Va.

Filed Mar. 27, 1978, Ser. No. 890,871

Int. Cl.[2] B01J *1/10*

U.S. Cl. 204—158 R **112 Claims**



45. Process for degrading a halogenated organic compound having at least one carbon-halogen group in such manner as to remove halogen from said compound, comprising: treating an

alkaline liquid solution of said compound with ultraviolet radiation in the range of about 1800 to 4000 A and hydrogen in the absence of any substantial amount of oxidizing agent.

4,144,153
RADIATION PROCESS FOR PRODUCING 1,2-POLYBUTADIENE FOAMED PRODUCTS

Yasuo Shikinami, Kusatsu; Ryuichi Kimura, Kyoto; Yoshinobu Yoshikawa, Azuchi; Kosuke Iida, Azuchi, and Kunihiro Hata, Azuchi, all of Japan, assignors to Takiron Co., Ltd., Azuchi, Japan

Filed Oct. 1, 1976, Ser. No. 728,653

Claims priority, application Japan, Oct. 3, 1975, 50-120062; Mar. 8, 1976, 51-25250

Int. Cl.[2] C08F *2/46*

U.S. Cl. 204—159.2 **9 Claims**

1. A process for producing a photodegradable rubber foam product which comprises, in sequence:

mixing essentially 1,2-polybutadiene with 0.1 to 3% of a photosensitizer and with a thermally decomposable foaming agent, said 1,2-polybutadiene having about 70% or more 1,2-bonds, a molecular weight of not less than 100,000, a degree of crystallinity of about 10 to about 50% and 20% or more of a syndiotactic stero specific structure;

irradiating the resulting mixture with ultraviolet irradiation of a wavelength of 240 to 400 mμ for about 10 minutes or less to form a cross-linked material having a gel fraction of 30 to 80% (in boiling toluene; 7 hours); and

heating the resulting cross-linked material to 150° to 230° C. to decompose the foaming agent and produce a photodegradable rubber foam product.

4,144,154
POLYTHIOL ACCELERATED RADIATION CROSSLINKING OF OLEFINICALLY UNSATURATED POLYMERS

Robert L. Zapp, Hilton Head Island, S.C., and Alexis A. Oswald, Mountainside, N.J.

Continuation-in-part of Ser. No. 770,457, Feb. 22, 1977, Pat. No. 4,094,757, which is a continuation of Ser. No. 531,628, Dec. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 232,275, Mar. 6, 1972, Pat. No. 3,864,229. This application Jun. 8, 1978, Ser. No. 913,821

Int. Cl.[2] B01J *1/10, 1/12*

U.S. Cl. 204—159.18 **32 Claims**

1. In a process for the curing of a polymer having a number average of at least 50,000, using ionizing radiation, wherein said polymer is an olefinically unsaturated polymer having at least 15 mole % unsaturation the improvement which comprises incorporating into the polymer,

(a) about 0.5 to 6 parts per hundred by weight of polymer of a cure enhancer comprising a hydrocarbon polythiol having a number average molecular weight of about 150 to about 3,000 and having at least three thiol groups,

(b) about 1.0 to 10.0 parts per hundred by weight of polymer of a bivalent metal oxide, and

(c) about 0.5 to 5 parts per hundred by weight of polymer of an aliphatic acid with about 12 to 18 carbon atoms.

4,144,155
RADIATION PROCESS FOR PRODUCING A REACTIVE AQUEOUS EMULSION

Kunio Araki, Takasaki; Keizo Makuuchi, Sakai; Tohru Takagi, Takasaki, and Hiroyuki Nakayama, Kanagawa, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo and Kansai Paint Co., Ltd., Amagasaki, both of, Japan

Filed Aug. 15, 1977, Ser. No. 824,819

Int. Cl.[2] C08F *2/46*

U.S. Cl. 204—159.22 **5 Claims**

1. A process for producing a reactive aqueous emulsion comprising dispersing a monomer mixture of (a) from 65.0 to 98.8% by weight of a radical polymerizable hydrophobic ethylenic unsaturated monomer having one ethylenic unsaturated bond in its molecule and being selected from the group consisting of an acrylic ester, a methacrylic ester, a vinyl ester, styrene and mixtures thereof, (b) from 1.0 to 30.0% by weight of a radical polymerizable ethylenic unsaturated monomer having a glycidyl group and being selected from the group consisting of glycidyl acrylate, glycidyl methacrylate, allylglycidyl ether, an adduct of a compound having two glycidyl groups with acrylic acid or methacrylic acid, and mixtures thereof, and (c) from 0.2 to 5.0% by weight of a radical polymerizable ethylenic unsaturated monomer having a carboxylic group being selected from the group consisting of acrylic acid, methacrylic acid, crotonic acid, itaconic acid and mixtures thereof, in water and from 0.05 to 10.0% by weight of a surface active agent, and irradiating with a total dose of from 0.01 to 1.0 Mrad of an ionizing radiation to effect emulsion polymerization.

4,144,156
MANUFACTURE OF UNSYMMETRIC MONOACETALS OF AROMATIC 1,2-DIKETONES EMPLOYABLE AS PHOTOINIATIATORS

Werner Kuesters, Ludwigshafen; Manfred Jacobi, Frankenthal, and Rolf Osterloh, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

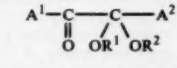
Filed Apr. 14, 1977, Ser. No. 787,569

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1976, 2616382; Apr. 14, 1976, 2616408

Int. Cl.[2] C08F *2/46, 4/00*

U.S. Cl. 204—159.23 **8 Claims**

1. In a composition photopolymerizable with UV radiation and containing a compound having at least one polymerizable carbon-carbon double bond and further containing a photoinitiator, the improvement which comprises; using as the photoinitiator an unsymmetric monoketal of an aromatic 1,2-diketone of the formula



(I)

where A^1 and A^2 are identical or different aromatic radicals each of which having from 6 to 12 carbon atoms which are either unsubstituted or which may bear from one of four substituents selected from the group consisting of hydrocarbon radicals having 1 to 10 carbon atoms, alkoxy radicals having 1 to 10 carbon atoms, alkoxyalkyl radicals having 2 to 10 carbon atoms, alkylthio radicals having 1 to 6 carbon atoms and/or halogen and R^1 and R^2 are hydrocarbon radicals of 1 to 12 carbon atoms in which the chain may or may not be interrupted by —O— or —S— or bear a halogen, said radicals R^1 and R^2 being characterized in that they differ one from another.

4,144,157
ACRYLIC AND METHACRYLIC SELF-ADHESIVE COMPOSITION AND RADIATION METHOD OF MAKING SAME

Gunter Guse; Ernst Lukat; Peter Jauchen; Wolfdieter Lenck, all of Hamburg, and Hanns Pietsch, Neuer Wall, all of Fed. Rep. of Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Aug. 27, 1975, Ser. No. 608,246

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1974, 2443414

Int. Cl.[2] C08F *2/46, 4/00*

U.S. Cl. 204—159.23 **12 Claims**

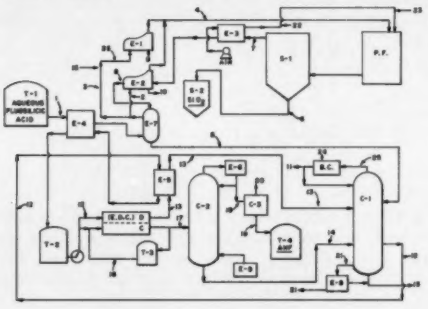
1. A method for the preparation of a self-adhesive composition comprising copolymerizing 0.01 to 5% by weight based on said composition of a compound taken from the class consisting of acrylic and methacrylic [(2-alkoxy-2-phenyl-2-benz-

oyl) ethyl] esters with at least one monomer capable of producing a self-adhesive polymer, followed by crosslinking said composition by exposure to ultraviolet radiation.

4,144,158
PROCESS FOR MANUFACTURE OF ANHYDROUS HYDROGEN FLUORIDE AND FINELY DIVIDED SILICA FROM FLUOSILICIC ACID

Krishnamurthy Nagasubramanian, Parsippany; Frederick P. Chlanda, Rockaway, and Kang-Jen Liu, Bridgewater, all of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris Country, N.J.

Filed Nov. 14, 1977, Ser. No. 851,234
Int. Cl.[2] B01D *13/02;* C01B *7/19, 33/00*
U.S. Cl. 204—180 P 10 Claims



1. In a process for converting aqueous fluosilicic acid to anhydrous hydrogen fluoride and finely divided silica comprising pyrolyzing aqueous fluosilicic acid to form finely divided silica and a dilute aqueous solution of hydrogen fluoride and fluosilicic acid and thereafter distilling out hydrogen fluoride, the improvement which comprises subjecting the dilute solution to electrodialysis, thereby obtaining a hydrogen fluoride concentration greater than that which characterizes the boiling point ridge which divides the phase diagram of the system hydrogen fluoride/fluosilicic acid/water into two regions, and recovering anhydrous hydrogen fluoride from the resulting composition by distillation.

4,144,159
ELECTRODEPOSITION OF N-HETEROCYCLIC-CONTAINING RESINS

Joseph F. Bosso, Lower Burrell, and Nicholas T. Castellucci, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 807,757, Jun. 17, 1977, Pat. No. 4,110,287, which is a continuation-in-part of Ser. No. 561,012, Mar. 21, 1975, abandoned. This application Apr. 28, 1978, Ser. No. 900,942
Int. Cl.[2] C25D *13/06*
U.S. Cl. 204—181 C 10 Claims

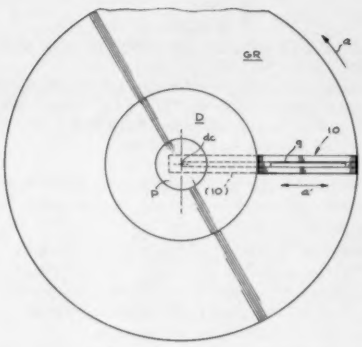
1. In a method of coating a conductive substrate serving as a cathode, which method comprises passing electric current between an anode and said cathode in electrical contact with a water-dispersed composition, the improvement wherein the water-dispersed composition is a water-dispersible resin which is electrodepositable on the cathode and which contains in the resin molecule amine salt groups and/or onium salt groups, said resin being prepared from polyglycidyl ethers of polyphenols and which contains in the resin molecule N-heterocyclic moieties obtained by reacting said polyepoxide with an N-heterocyclic material containing a 5 or 6-membered ring and containing

moieties.

4,144,160
APPARATUS FOR ELECTRO DEPOSITION OF MAGNETICALLY ANISOTROPIC METALLIC RECORDING FILMS

John P. Faulkner, Thousand Oaks, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 17, 1977, Ser. No. 807,154
Int. Cl.[2] C25D *17/00, 17/10*
U.S. Cl. 204—212 10 Claims

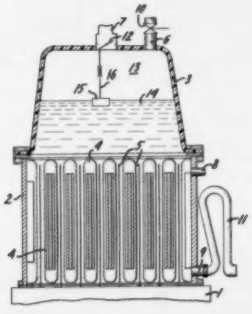


1. An improved plating arrangement including a plating magnet/electrode combination, this combination comprising a magnetic recording transducer and plating electrode means, the transducer including a pair of magnetic poles adapted to generate a prescribed magnetic flux, the plating electrode means being arranged to operate through said flux; these poles and electrode means being immersed in the plating electrolyte.

4,144,161
ELECTROLYTIC DIAPHRAGM CELL

Louis Bourgeois, Brussels, Belgium, assignor to Solvay & Cie, Belgium

Filed Apr. 1, 1977, Ser. No. 783,823
Claims priority, application France, Apr. 26, 1976, 76 12489
Int. Cl.[2] C25B *15/00*
U.S. Cl. 204—229 10 Claims



1. Electrolytic diaphragm cell, comprising an anode compartment and a cathode compartment separated by a pervious diaphragm, an inlet-pipe and an outlet-pipe for electrolyte, means for controlling the feed of electrolyte, a gas outlet-pipe connected to the anode compartment or the cathode compartment, a valve of variable aperture placed in said gas outlet-pipe, a vessel in communication, at its upper part, with said gas

outlet-pipe, upstream of the valve and, at its lower part, with said compartment connected to the gas outlet-pipe, a float located in the vessel and means connecting said valve to said float to progressively close, respectively open, the valve when the float is moved upwardly, respectively downwardly in the vessel, said vessel, float and connecting means being arranged to have the vessel partially filled with electrolyte and the valve in an intermediate partially closed position in normal operation of the cell.

4,144,162

METHOD FOR THE CONTAINMENT OF OILS AND OIL SLUDGES

Allen C. Edgar, Gainesville, and George N. Smith, Ocala, both of Fla., assignors to Mid-Florida Mining Co., Lowell, Fla.

Filed Sep. 1, 1977, Ser. No. 829,913
Int. Cl.[2] C10G *17/00*
U.S. Cl. 208—13 **6 Claims**

1. A method for the solidification and containment of oil waste to permit environmentally safe storage disposal comprising the steps of:

homogenously mixing the oil waste with particulate fuller's earth having a particle size in the −6 to 0 mesh range and a free moisture content of 2 to 6% in a weight ratio of at least 40:60 fuller's earth to oil waste to form an intimate mixture of oil waste and fuller's earth,

allowing the intimate mixture to harden to a paste-like consistency, and

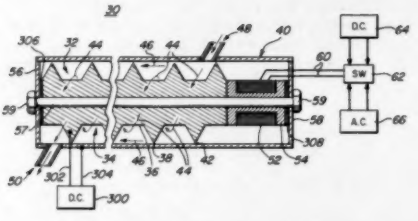
conveying the mixture to a storage disposal sight.

4,144,163

MAGNETODENSITY SEPARATION METHOD AND APPARATUS

Henry H. Kolm, Wayland, Mass., assignor to Sala Magnetics, Inc., Cambridge, Mass.

Filed Jun. 5, 1975, Ser. No. 584,186
Int. Cl.[2] B03B *7/00*; B03C *1/30*
U.S. Cl. 209—12 **44 Claims**



1. A method of separating more magnetically susceptible particles from less magnetically susceptible particles carried in a fluid medium comprising:

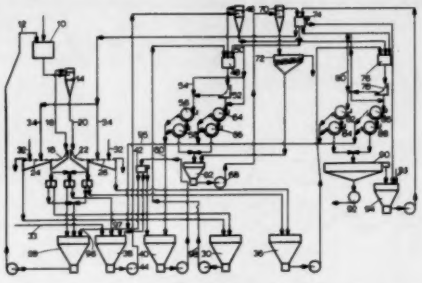
simultaneously subjecting said medium to a magnetic field and field gradient and a mechanical force field for separating said medium into a first flow in which magnetically susceptible particles magnetically flocculate under the influence of the magnetic field to form larger particles, and a second flow which is adjacent and in communication with said first flow and which moves locally transversely of said first flow, urging said larger particles from said first flow toward said second flow by means of said magnetic field gradient and said mechanical force field, and entrapping said larger particles entering said second flow by means of local regions of high magnetic field gradient located along the path of and transverse to said second flow.

4,144,164

PROCESS FOR SEPARATING MIXTURES OF PARTICLES

Joseph H. Absil, Arlington Heights, Ill., and Heinrich J. Mengelers, Brunssum, Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Sep. 20, 1977, Ser. No. 835,031
Int. Cl.[2] B03B *9/00*
U.S. Cl. 209—12 **9 Claims**



1. In a continuous process for separating a mixture including relatively fine solid particles, differing in size and specific gravity, with the aid of a heavy medium which includes magnetizable particles as weighting material, the process including the steps of:

(a) feeding the mixture including the relatively fine particles to a specific gravity separating means to divide the mixture into a relatively fine specifically light fraction and a relatively fine specifically heavy fraction,

(b) combining said relatively fine specifically light fraction with a liquid to form a first diluted fraction,

(c) removing the magnetizable particles from said first diluted fraction by magnetic separation,

(d) after the removal of the magnetizable particles, separating the bulk of the relatively fine specifically light particles from the liquid in said first diluted fraction,

the improvement comprising:

passing at least a portion of the liquid remaining after separation of the bulk of the light particles from said first diluted fraction to a tank, combining the liquid in said tank with said relatively fine specifically heavy fraction to form a second diluted fraction,

removing magnetizable particles from said second diluted fraction by magnetic separation,

after the removal of the bulk of the magnetizable particles from said second diluted fraction, separating the bulk of the relatively fine specifically heavy particles from the liquid in said second diluted fraction, and

recovering the liquid from said second diluted fraction for re-use in the process.

4,144,165

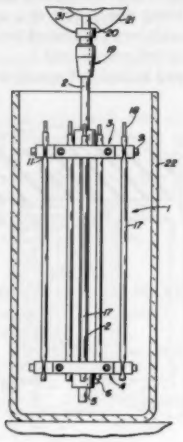
DIALYZER, SYSTEM AND DIALYSIS METHOD

Andrew R. Matz, Hare's Hill Rd., P.O. Box 445, Kimberton, Pa. 19442

Filed Dec. 7, 1977, Ser. No. 858,414
Int. Cl.[2] B01D *31/00, 13/00*
U.S. Cl. 210—22 C **16 Claims**

12. A method of dialysis comprising providing a vertically aligned array of a plurality of dialysis bags around the complete periphery of a dialyzer mounting means, rotating said dialyzer mounting means and said array of bags in a dialyzer bath, said rotation of said monting means providing a circulating pumping action of liquid contained in said bath upwardly into that volume of said bath bounded on the sides by said

array of dialyzer bags by causing an inclined opening in the bottom of said mounting means to circulate dialyzer bath liquid



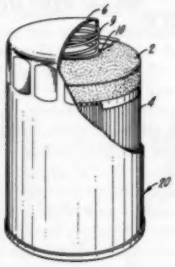
into the volume of bath liquid bounded by said array of dialyzer bags.

4,144,166

COMPOSITIONS, APPARATUS AND METHODS USEFUL FOR RELEASING SOLID LUBRICATING OIL ADDITIVE

James M. DeJovine, Homewood, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed Mar. 24, 1977, Ser. No. 780,900
Int. Cl.[2] C10M *11/00*
U.S. Cl. 210—60 **5 Claims**



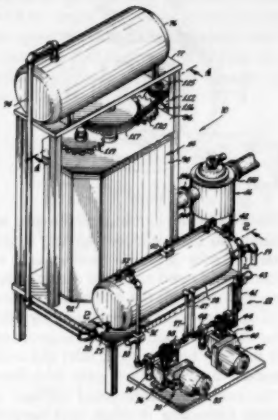
1. A method for at least maintaining the lubricating quality of a circulating lubricating oil composition in an internal combustion engine having a filter means comprising contacting at least a portion of said circulating oil with a material selected from the group consisting of (1) a solid thermoplastic polymer having a controlled rate of dissolution in said oil composition, said polymer having solid particles effective to at least maintain the lubricating quality of said oil composition, (2) a liquid suspension containing such solid particles and mixtures thereof, thereby adding solid particles to said circulating lubricating oil composition, said solid particles being sized sufficiently small to substantially avoid being removed from the lubricating oil composition by said filter means used to remove solid contaminants from the composition, and being of graphite.

4,144,167

SEWAGE TREATMENT SYSTEM

Albert L. Burkett, 3700 E. Bellevue No. 313, Tucson, Ariz. 85716, and Albert O. Nelson, P.O. Box 248, Tucson, Ariz. 85702

Filed Apr. 14, 1977, Ser. No. 787,567
Int. Cl.[2] B01D *35/00*; B02C *23/38*
U.S. Cl. 210—104 **13 Claims**



1. A system for treatment of aqueous raw sewage comprising:

(a) a centrifugal mill having at least one inlet port through which aqueous raw sewage and air are suppliable to the interior of said mill, said centrifugal mill for subjecting the aqueous raw sewage and air to turbulence and impact forces for aeration of aqueous raw sewage and disintegration of the solids therein, said centrifugal mill having an outlet port, said centrifugal mill comprising,

a) (I) a housing having a vertically disposed bore formed therethrough and a head plate in which the inlet port of said centrifugal mill is formed and a bottom plate adjacent which the outlet port of said centrifugal mill is formed,

b) (II) a main shaft vertically disposed in the bore of said housing and rotatably mounted therein,

c) (III) a first plurality of comminution means each affixed to said main shaft for rotation therewith and axially spaced along the length of said main shaft, each of said first plurality of comminution means disposed in a different plane transverse to the longitudinal axis of said main shaft,

d) (IV) at least one outboard shaft vertically disposed in the bore of said housing and rotatably mounted therein,

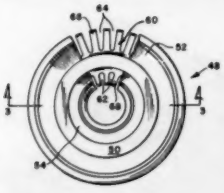
e) (V) a second plurality of comminution means affixed to said outboard shaft for rotation therewith and axially spaced along the length of said outboard shaft, each of said second plurality of comminution means disposed in a different plane transverse to the longitudinal axis of said outboard shaft,

f) (VI) drive means coupled to said main shaft and to said outboard shaft for rotatably driving those shafts in opposite directions;

(b) evacuator means connected to the inlet port of said centrifugal mill and connectable to a source of aqueous raw sewage for extracting the sewage from the source and supplying it to the interior of said centrifugal mill through the inlet port thereof; and

(c) self cleaning screen means connected to the outlet port of said centrifugal mill for separating the disintegrated solids from the aqueous sewage exiting from said centrifugal mill.

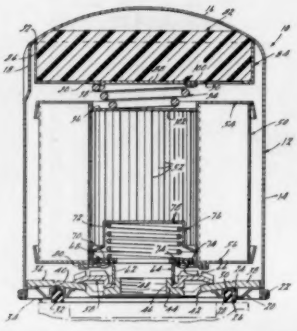
4,144,168
FLUID FILTER
Donald I. Thornton, Warwick, R.I., assignor to Fram Corporation, East Providence, R.I.
Filed Oct. 26, 1977, Ser. No. 845,756
Int. Cl.[2] B01D *35/14*
U.S. Cl. 210—130 **1 Claim**



1. In a fluid filter, an outer shell having an open end, an annular cylindrical filter element having inner and outer circumferential surfaces disposed within said shell, a closure member closing said open end, said closure member having an inlet communicating with the outer circumferential surface of said element and an outlet communicating with the inner circumferential surface of said element, support means carried by said closure member between said inlet and outlet and supporting said element so that a flow path is defined between said inlet and the outer circumferential surface of the element, passage means extending through said support means to directly communicate the inlet and outlet when the element is clogged and an annular valve disc defining a circumferentially extending shoulder located between the element and said support means and having an inner circumferential area extending radially inwardly from said shoulder and controlling communication through said passage means and an outer circumferential area extending radially outwardly from said shoulder controlling communication through said flow path, said annular valve disc comprising a spring member encapsulated within a sealing material, said inner circumferential area being serrated radially to define a plurality of circumferentially spaced, independently movable spring fingers, said sealing material encapsulating the fingers and the spaces therebetween to provide an inner continuous sealing surface, the outer circumferential edge of said inner sealing surface sealingly engaging said support means to prevent communication through the passage means until the pressure differential between the inlet and outlet attains a predetermined level sufficient to deflect said fingers, said outer circumferential area being serrated to define a plurality of circumferentially spaced, independently movable spring fingers, said sealing material encapsulating the fingers and the spaces therebetween to define an outer continuous sealing surface, the periphery of said outer sealing surface engaging said closure member to prevent communication through said flow path to prevent fluid from draining from said filter through the inlet.

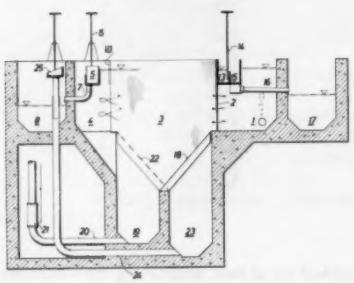
4,144,169
FILTER UNIT
Clifford H. Grueschow, Monroe, Mich., assignor to Monroe Auto Equipment Company, Monroe, Mich.
Filed Jun. 6, 1977, Ser. No. 803,979
Int. Cl.[2] B01D *35/00;* C10M *7/10*
U.S. Cl. 210—168 **4 Claims**

1. In a filter unit for use with a circulating oil system,
sais unit including an enclosure having a side wall section, a closed end section and an open end section,
a filter element disposed within said enclosure,
a closure member closing said open end section of said housing and defining inlet and outlet flow paths along which fluid may pass between said filter element and the associated fluid system,
combination thereof with:
an additive body within said enlosure located between said closed end section thereof and the adjacent end of said filter element, said body being of a disc shaped configuration and disposed within a cup-shaped retainer member, said body being dissolvable at a controlled rate so as to replace oil additives comsumed during operation of the oil in the associated system, and
conically-shaped helical coil spring means for transmitting a



compressive force against said element from said retainer member and thereby retaining said element and additive body in their respective operative positions within said enclosure independent of dimensional tolerances and without transmitting said force directly through said body so as to be operable independently of the amount of said body that has been dissolved as a result of additives being replaced in the oil.

4,144,170
APPARATUS FOR WATER TREATMENT
Karl R. Dunkers, Hästskovägen 7, S-183 50 Täby, Sweden
Filed Sep. 19, 1977, Ser. No. 834,558
Claims priority, application Sweden, Sep. 29, 1976, 7610792; Sep. 29, 1976, 7610793
Int. Cl.[2] B01D *21/10*
U.S. Cl. 210—221 P **5 Claims**



1. Apparatus for separating settleable and floating materials from polluted water, comprising
an inlet means for supplying water to the apparatus,
an assembly of a plurality of spaced parallel lamellae defining narrow passages arranged for the flow of water in a mainly horizontal direction through said passages, said passages comprising a first set of passages which communicate along one side of the assembly with the inlet means, so that the water can enter said first set of passages and flow in parallel therethrough toward the opposite side of said assembly, and a second set of passages which are closed toward the inlet means at said first side of the assembly,

a flow reversal chamber arranged along said opposite side of the assembly and communicating with both said first set of passages and said second set of passages, so that water may enter said flow reversal chamber from said first set of passages and then enter said second set of passages to flow in parallel therethrough and in an opposite direction to the flow of water through said first set of passages,

means for removal of floating separable material in said flow reversal chamber,

outlet means communicating with said second set of passages at the ends thereof opposite to the flow reversal chamber, said passages being at least partially open at their bottoms, so that settleable solids leave said passages in a downward direction, and

means for collecting said settleable solids.

4,144,171

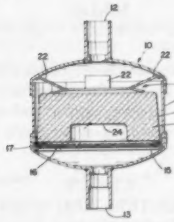
FILTER BLOCK AND METHOD OF MAKING THE SAME

Walter O. Krause, Newark, N.Y., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Dec. 27, 1977, Ser. No. 864,560

Int. Cl.[2] B01D *27/04, 39/14*

U.S. Cl. 210—496 **13 Claims**



1. A porous block for filtering and drying refrigerant fluid, said block comprising particles of an adsorbent bound together by a copolymer, said copolymer being formed from a phenolic resin and a polyurethane resin, said particles comprising at least about 86.5% of said finished block by weight and no more than about 97% of said finished block by weight, said binder comprising at least about 3% of said finished block by weight and no more than about 13.5% of said finished block by weight, the weight of the initial phenolic resin component being at least about 1.2% of said finished block by weight and no more than about 5.4% of said finished block by weight, and the weight of the initial polyurethane resin component being at least about 1.8% of said finished block by weight and no more than about 8.1% of said finished block by weight.

9. A porous block for filtering and drying refrigerant fluid, said block comprising particles of an adsorbent bound together by a copolymer formed from phenolic resin and a polyurethane resin, the ratio of the weight of the initial phenolic resin component to the weight of the finished block and the ratio of the weight of the initial polyurethane resin component to the weight of the finished block being selected so that the pressure drop of air at room temperature flowing through a one square inch section of ½" thickness of said finished block at 400 cubic feet per hour has a pressure drop of no greater than about 4 inches of water.

4,144,172

INDUSTRIAL LIQUID CLEANSING APPARATUS

Earl J. Bennecke, and Mark R. Bennecke, both of 8249 S. Lockwood, Burbank, Ill. 60459

Filed Jan. 3, 1978, Ser. No. 866,808

Int. Cl.[2] B01D *21/02*

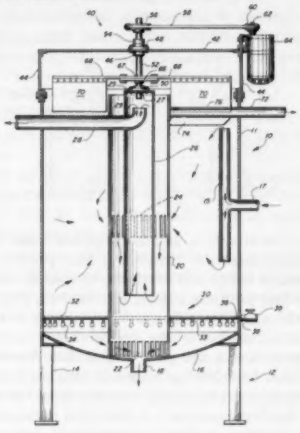
U.S. Cl. 210—525 **8 Claims**

1. A solid waste separator apparatus comprising:

(a) a shell having a large hydraulic diameter vertically oriented relative to gravity and a sealed bottom connected thereto with a sludge drain mounted therein;

(b) inflow separator tube means of small hydraulic diameter and open at both ends vertically oriented within and adjacent to the wall of the shell below the level of the liquid in the shell and in fluid communication with an external source of dirty liquid;

(c) first separator pipe means of intermediate hydraulic diameter open at its ends and vertically oriented within the shell with its lower portion adjacent the bottom of the shell and its upper portion extending above the level of the liquid therein, said first pipe means having its lower portion and midsection portion in fluid communication with the interior of the shell;



(d) second separator pipe means of small hydraulic diameter vertically oriented within the first separator pipe means and extending from adjacent the lower portion of the first separator pipe to a point above the level of the liquid therein, said second pipe means having its lower portion in fluid communication with the first separator pipe means between the lower portion of the mid portion thereof;

(e) outflow liquid leveling pipe means of small hydraulic diameter vertically oriented within the upper portion of the second separator pipe means below the level of the liquid in said shell and in fluid communication with the upper portion of the second separator pipe means; and

(f) discharge pipe means in fluid communication with said outflow liquid leveling pipe means.

4,144,173

DEVICE FOR SKIMMING MATERIAL FLOATING ON A LIQUID

Jacob Pielkenrood, Krommenie, Netherlands, assignor to Pielkenrood-Vinitex B.V., Assendelft, Netherlands

Continuation-in-part of Ser. No. 700,754, Jun. 29, 1976, abandoned. This application Aug. 24, 1977, Ser. No. 827,247

Claims priority, application Netherlands, Jul. 1, 1975, 75/07791

Int. Cl.[2] B01D *21/18*

U.S. Cl. 210—525 **13 Claims**

1. A raking device for discharging floating material supernatant on a liquid contained in a basin by pushing the floating material along the surface of the liquid toward an overflow weir connected to one end wall, said raking device comprising in combination:

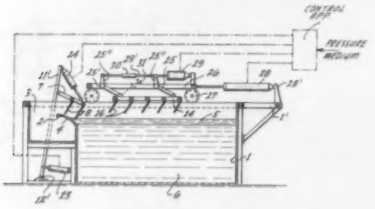
a basin having side walls and end walls, the upper portions of said walls extending above the supernatant layer, said basin further having a weir including an inclined surface extending into the supernatant layer;

a first frame positioned between the upper portions of the side walls;

a plurality of blades attached to said first frame and spaced in the direction of pushing toward the weir to form a first rake assembly, each blade having a pushing surface extending substantially transversely to said frame;

first suspension means connecting said first frame to walls of said basin for movement with respect to said basin in a first direction substantially parallel to the pushing direction, and in a second direction substantially transversely to said first direction;

first driving means connected to said frame to reciprocate it in the first direction, the stroke length of the reciprocating movement being a fraction of the length of said basin in



the first direction, and to reciprocate said first frame in the second direction between a first position and a second position which are vertically spaced so that the blades, in the first position, extend into said supernatant layer, and, in the second position, are completely retracted from said supernatant layer, the reciprocating movements in said first direction and said second direction being correlated by said first driving means so that each blade describes a closed-loop trajectory, moving from the second position to the first position in a direction substantially parallel to the pushing surface of each blade and moving substantially parallel to said supernatant layer while in the first position, the trajectories of the different blades being staggered in the first direction.

4,144,174

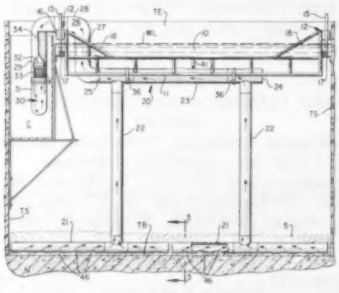
TRAVELING SIPHON SLUDGE COLLECTOR

Richard B. Graham, and Richard N. Mercurio, both of Columbus, Ohio, assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jul. 14, 1977, Ser. No. 815,482

Int. Cl.[2] C02C *1/36*

U.S. Cl. 210—527 **16 Claims**



1. Apparatus for collecting and removing sludge from the bottom of a settling tank, comprising:

traveling support means mounted to at least one wall of the tank for movement parallel to said wall;

a siphon tube suspended in the tank from said traveling support means and comprising: a header disposed near the water's surface and extending laterally from said one tank wall substantially across one dimension of the tank, at least two sludge intakes disposed near the tank bottom proximate the settled sludge at spaced locations along said one dimension of the tank, each intake being connected to the header by a separate riser; and an arched section extending from one end of the header up and over a wall of the tank; and a flow regulating discharge section adjustably connected to the outlet end of the arched section and having an opening to discharge the sludge outside the tank, wherein all of said siphon tube except at least part of the arched section is submerged in the water in the tank; and

drive means for moving the support means and siphon tube such that the sludge intakes sweep across the tank bottom while the siphon extracts the sludge and discharges it outside the tank.

4,144,175

CONSTANT BOILING ADMIXTURES

William M. Hutchinson, deceased, late of Bartlesville, Okla., and by Florence M. Hutchinson, executrix, Claremore, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 783,243, Mar. 31, 1977, Pat. No. 4,097,398, which is a division of Ser. No. 690,807, May 27, 1976, Pat. No. 4,039,465, which is a division of Ser. No. 602,353, Aug. 6, 1975, Pat. No. 4,024,086. This application Dec. 28, 1977, Ser. No. 865,160

Int. Cl.[2] C09K *3/30*; C23G *5/02*

U.S. Cl. 252—1 **3 Claims**

1. A substantially constant boiling admixture of (A) 1,1,2-trifluoroethane and (B) dichlorofluoromethane wherein said (A) represents about 59.5 weight percent, and said (B) about 40.5 weight percent at substantially atmospheric pressure.

4,144,176

FIBER-TREATING AGENT

Hideo Kawanaka, Osaka; Toshio Sato, Wakayama, and Yosihiko Kasahara, Kainan, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jun. 28, 1978, Ser. No. 919,933

Claims priority, application Japan, Jul. 1, 1977, 52/78612

Int. Cl.[2] D06M *13/26*

U.S. Cl. 252—8.7 **4 Claims**

1. A composition of fiber treating agent containing α-olefinsulfonic acid salts of 20 or above carbon atoms inclusive.

4,144,177

SOFTENER COMPOSITION FOR FABRICS

Yutaka Minegishi, Saitama, and Haruhiko Arai, Narashino, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

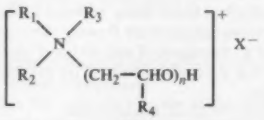
Filed Oct. 7, 1977, Ser. No. 840,401

Claims priority, application Japan, Oct. 19, 1976, 51/125938

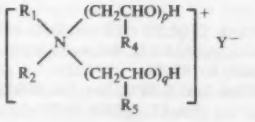
Int. Cl.[2] D06M *13/36*

U.S. Cl. 252—8.8 **7 Claims**

1. A liquid fabric softener composition, consisting essentially of (A) a quaternary ammonium salt having the formula:



or



wherein R_1 and R_2 each are alkyl having 12 to 22 carbon atoms or β-hydroxyalkyl having 13 to 24 carbon atoms,

R_3 is alkyl having 1 to 3 carbon atoms, R_4 and R_5 each are hydrogen or methyl, X is halogen, a monoalkyl sulfuric acid group having an alkyl group containing 1 to 3 carbon atoms or a monocarboxylic acid group having 2 or 3 carbon atoms, Y is halogen or a monocarboxylic acid group having 2 or 3 carbon atoms, n is a number of from 1 to 3, and p and q each are a number of 1 or 2 with the proviso that the sum of p and q is 2 or 3, or mixture thereof,

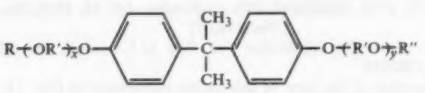
(B) an anionic surface active agent or mixture thereof, the mixing molar ratio of (A):(B) being in the range of from 1:0.3 to 1:1, and (C) the balance is essentially water, the sum of (A) plus (B) being from 3 to 20% by weight, based on the total weight of the composition.

4,144,178
COMPOSITION FOR LUBRICATING TREATMENT OF SYNTHETIC FIBERS

Kenichi Katabe, and Takeshi Hirota, both of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jul. 18, 1978, Ser. No. 925,865
Claims priority, application Japan, Aug. 12, 1977, 52-97130
Int. Cl.[2] D06M *13/10*
U.S. Cl. 252—8.9 **17 Claims**

1. A composition for lubricating synthetic fibers, which comprises (i) a base oil containing (a) one or a mixture of two or more compounds of the formula (I):



(I)

wherein R and R'' each are hydrogen or acyl having 1 to 22 carbon atoms, R' is alkylene having 2 to 4 carbon atoms, and x and y each is an integer of at least 1, with the proviso that the sum of x and y does not exceed 50, and (b) one or a mixture of two or more esters selected from the group consisting of esters of aliphatic monohydric alcohols with monobasic fatty acids, dibasic fatty acids or mixture thereof and esters of aliphatic polyhydric alcohols with monobasic fatty acids, said ester having a kinematic viscosity not higher than 70 centistokes measured at 30° C., and (ii) a polymer of 2,2,4-trimethyl-1,2-dihydroquinoline.

4,144,179
COMPOSITION FOR TREATING LOW TEMPERATURE SUBTERRANEAN WELL FORMATIONS

Jiten Chatterji, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 597,750, Jul. 21, 1975, abandoned, which is a continuation of Ser. No. 446,870, Feb. 28, 1974, abandoned. This application Apr. 15, 1977, Ser. No. 787,824
Int. Cl.[2] E21B *43/26, 43/22*
U.S. Cl. 252—8.55 R **24 Claims**

1. An aqueous composition for treating subterranean formations having temperatures of up to about 120° F. consisting essentially of:

an aqueous liquid, a water soluble organic gelling agent present in said aqueous liquid in an amount sufficient to increase the viscosity thereof, a water soluble oxidizing agent having the property of generating free radicals, and a water soluble reducing agent to accelerate the generation of said free radicals;

wherein said reducing agent is a water soluble metal salt, selected from the group consisting of cuprous, ferrous, stannous, cobaltous, chromous, nickelous, titanous, manganous and arsenous salts of the halides, sulfates and nitrates and mixtures thereof; and said reducing agent is present in said composition in an amount in the range of from about 0.1 to about 7.5 parts by weight per 100 parts by weight aqueous liquid; and

wherein said oxidizing agent is selected from the group consisting of water soluble peroxide compounds, water soluble persulfate compounds and mixtures thereof and said oxidizing agent is present in an amount of about 0.001 to about 2 parts by weight free radical generating agent per 100 parts by weight aqueous liquid; and further

wherein said organic gelling agent is selected from the group consisting of guar gum, locust bean gum, gum tragacanth, hydroxyethyl guar gum, hydroxypropyl guar gum, carboxymethyl guar gum and mixtures thereof.

13. A method for reducing the viscosity of an aqueous gelled composition, said method consisting essentially of:

preparing an aqueous gelled composition by mixing a water soluble gelling agent and a water soluble reducing agent with an aqueous liquid, said gelling agent being present in an amount to increase the viscosity of the aqueous liquid to a desired level,

mixing with said aqueous gelled composition a water soluble oxidizing agent having the property of generating free radicals, and

subjecting said aqueous gelled composition containing said oxidizing agent and said reducing agent to temperatures of up to about 120° F. for a time sufficient to reduce the viscosity of said aqueous gel;

wherein said reducing agent accelerates the generation of said free radicals and is a water soluble metal salt, selected from the group consisting of cuprous, ferrous, stannous, cobaltous, chromous, nickelous, titanous, manganous and arsenous salts of the halides, sulfates and nitrates and mixtures thereof; and said reducing agent is present in said composition in an amount in the range of from about 0.1 to about 7.5 parts by weight per 100 parts by weight aqueous liquid; and

wherein said oxidizing agent is selected from the group consisting of water soluble peroxide compounds, water soluble persulfate compounds and mixtures thereof and said oxidizing agent is present in an amount of about 0.0001 to about 2 parts by weight free radical generating agent per 100 parts by weight aqueous liquid; and

wherein said organic gelling agent is selected from the group consisting of sodium polyacrylate, polyacrylic acid, polysodium-2-acrylamide-3-propylsulfonate, polyacrylamides and polymethacrylamides hydrolyzed to convert from 0 to about 70 percent of amide groups to carboxyl groups which are then neutralized with ammonium or an alkali metal hydroxide; guar gum, locust bean gum, gum tragacanth, hydroxyethyl guar gum, hydroxypropyl guar gum, carboxymethyl guar gum and mixtures thereof.

4,144,180
DERIVATIVES OF TRIAZOLE AS LOAD-CARRYING ADDITIVES FOR GEAR OILS

Harry J. Andress, Jr., Wenonah, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 3, 1977, Ser. No. 838,698
Int. Cl.[2] C10M *1/44, 1/10;* **C07D** *261/00, 249/00*
U.S. Cl. 252—32.5 **16 Claims**

1. A lubricant composition comprising a major amount of an oil of lubricating viscosity or greases thereof and a load carrying amount of the reaction product of (A) benzotriazole or a lower alkylbenzotriazole with (B) a mono- or di-alkylphosphonate having 4 to 14 carbon atoms per alkyl group, a mono- or di-alkyl phosphate having 4 to 14 carbon atoms per alkyl group, a primary fatty amine having 6 to 26 carbon atoms, a naphthenyl oxazoline, or an alkenylsuccinyl mono- or bis-oxazoline; wherein the reaction is conducted at a temperature between about 100° C. and about 200° C. and in a mole ratio of (A) to (B) of 1:2, in the case of phosphonates and phosphates, and of about 1:1, in the case of amines and oxazolines.

9. The reaction product of (A) benzotriazole or a lower alkylbenzotriazole with (B) a mono- or di-alkylphosphonate

having 4 to 14 carbon atoms per alkyl group, a mono- or dialkyl phosphate having 4 to 14 carbon atoms per alkyl group, a primary fatty amine having 6 to 26 carbon atoms, a naphthenyl oxazoline, or an alkenylsuccinyl mono- or bis-oxazoline; wherein the reaction is conducted at a temperature between about 100° C. and about 200° C. and in a mole ratio of (A) to (B) of about 1:2, in the case of phosphonates and phosphates, and of about 1:1, in the case of amines and oxazolines.

4,144,181

POLYMERIC ADDITIVES FOR FUELS AND LUBRICANTS

Robert L. Elliott, Scotch Plains, and John B. Gardiner, Mountainside, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 29, 1977, Ser. No. 792,199

Int. Cl.[2] **C10M** *1/40, 3/34, 5/22;* **C10L** *1/22*

U.S. Cl. 252—33 **16 Claims**

1. A substantially haze-free lubricating oil composition comprising a lubricating oil and from about 0.1 to 50 wt. %, based upon the total weight of said composition, of ethylene copolymeric dispersant-viscosity index improver material, which material has been formed by grafting an ethylene copolymer comprising about 30 to 80 wt. % ethylene and about 20 to 70 wt. % C_3 to C_{18} alpha olefin, with an ethylenically unsaturated compound selected from the group consisting of unsaturated carboxylic acid and anhydride of carboxylic acid, said ethylene copolymer when grafted with said carboxylic acid or said anhydride being further reacted with a polyfunctional reactant selected from the group consisting of polyamine, polyol and hydroxy amine, and reacting with from about 0.1 to 8 wt. % of an oil-soluble hydrocarbyl substituted strong acid containing from about 3 to about 70 total carbons to thereby inhibit haze in said composition, and wherein said strong acid is selected from the group consisting of alkyl carboxylic acids, phosphoric acid, phosphonic acid, thiophosphonic acid, phosphinic acid, thiophosphinic acid, sulfonic acid, sulfuric acid, sulfinic acid and alpha-substituted halo- or nitro- or nitrilo- carboxylic acids.

12. A substantially haze-free lubricating oil composition comprising a lubricating oil and from about 0.1 to 50 wt. %, based upon the total weight of said composition, of ethylene copolymeric dispersant-viscosity index improver material, which material has been formed by grafting an ethylene copolymer comprising about 30 to 80 wt. % ethylene and about 20 to 70 wt. % C_3 to C_{18} alpha olefin, with a vinyl monomer containing nitrogen, and reacting with from about 0.1 to 8 wt. % of an oil-soluble hydrocarbyl substituted strong acid containing from about 3 to about 70 total carbons, to thereby inhibit haze in said composition.

4,144,182

SALTS OF ALKYLENEDIAMINE CARBOXYLIC ACIDS AND AQUEOUS SOLUTIONS THEREOF

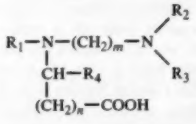
Heinz Bereuter, An der Steinlache 10, Hard, Austria (6971)

Filed Jul. 8, 1977, Ser. No. 813,968

Int. Cl.[2] **C10M** *1/32;* **C09F** *5/00*

U.S. Cl. 252—34 **3 Claims**

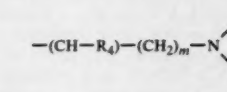
1. A compound which is an acid of the formula



wherein R_1 is alkanoyl of a monocarboxylic acid or alkenoyl having 6 to 20 carbon atoms;

R_2 is hydrogen, R_1, or $-(CH-R_4)-(CH_2)_n-COOH$;

R_3 is $-(CH-R_4)-(CH_2)_n-COOH$, $-[(CH_2)_m-(N-R_2)-]_z-(CH-R_4)-(CH_2)_n-COOH$, or



R_4 is alkyl having one to three carbon atoms, or hydrogen;

m is an integer between 2 and 6;

n is 0, 1, or 2; and

z is an integer between 1 and 6; or a water-soluble salt of said acid.

3. An aqueous solution of a compound as set forth in claim **1**, said compound amounting to 0.1 to 10 percent of the weight of said solution.

4,144,183

MIXED BRANCHED AND STRAIGHT CHAIN ESTER OILS

Karlheinz Koch, Haan, and Hermann Kroke, Erkrath-Unterbach, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 602,825, Aug. 7, 1975, Pat. No. 4,053,491, which is a continuation-in-part of Ser. No. 428,887, Dec. 27, 1973, abandoned. This application Jul. 22, 1977, Ser. No. 818,077

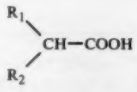
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1973, 2302918

The portion of the term of this patent subsequent to Oct. 11, 1994, has been disclaimed.

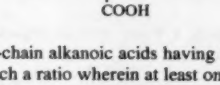
Int. Cl.[2] **C09F** *5/08;* **C11C** *3/00;* **C10M** *1/24*

U.S. Cl. 252—56 S **11 Claims**

1. A branched-chain aliphatic ester oil consisting essentially of a full ester of a branched-chain aliphatic polyol having from 2 to 6 primary hydroxyl groups selected from the group consisting of alkanepolyols having from 3 to 6 carbon atoms and alkoxyalkanepolyols having from 6 to 12 carbon atoms with a mixture of (A) α-branched-chain alkanoic acids having the formula



wherein R_1 and R_2 are alkyl having from 1 to 19 carbon atoms and the total number of carbon atoms in the acid is from 14 to 22, selected from the group consisting of (1) acids derived from the oxidation of α-branched alcohols formed from normal alcohols by the Guerbet synthesis and (2) an acid of the formula



and (B) straight-chain alkanoic acids having from 8 to 10 carbon atoms, in such a ratio wherein at least one of said primary hydroxyl groups is on average at least 80% esterified by said α-branched-chain alkanoic acids and at least one of said primary hydroxyl groups is on average at least 40% esterified by said straight-chain alkanoic acids.

10. In the process of facilitating the motion of one solid over the surface of another solid by providing a thin film of a lubricant between the surfaces of said solids in frictional contact, the improvement consisting essentially of utilizing at least one ester oil of claim **1** as said lubricant.

4,144,184
LIQUID DEVELOPER

Kei Takahata, Kusatsu; Sadao Murasawa, Itami, and Masatsuyo Maruo, Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

Filed Mar. 3, 1978, Ser. No. 883,311
Claims priority, application Japan, Mar. 7, 1977, 52-23912
Int. Cl.[2] G03G *9/12*
U.S. Cl. 252—62.1 L **10 Claims**

1. A liquid developer for an electrostatic latent image comprising a liquid of sufficiently high electrical resistivity, a particulate coloring agent and a charge controlling agent wherein said charge controlling agent is a mixture or reaction product of a zirconium (tetravalent) alkoxide or a vanadyl (trivalent) alkoxide with an organic compound containing hydroxyl group, carboxyl group or a carbon-carbon double bond in its molecule.

7. A liquid developer according to claim **1**, wherein said organic compound containing hydroxyl group, carboxyl group or a carbon-carbon double bond in its molecule is a carboxylic acid selected from the group consisting of myristic acid, stearic acid, stearic anhydride, oleic acid, linolic acid, lauric acid, palmitic acid, naphthenic acid, octenoic acid, octylic acid, undecanoic acid and linolenic acid.

8. A liquid developer for an electrostatic latent image comprising a liquid of sufficiently high electrical resistivity, a particulate coloring agent and a charge controlling agent, wherein said charge controlling agent is a reaction product of a zirconium (tetravalent) alkoxide with a saturated or unsaturated carboxylic acid having 8 to 18 carbon atoms.

4,144,185
METHOD AND COMPOSITION FOR REMOVING CALCIUM SULFATE SCALE DEPOSITS FROM SURFACES

Jacob Block, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Feb. 24, 1978, Ser. No. 880,831
Int. Cl.[2] C02B *5/06, 5/02*
U.S. Cl. 252—180 **2 Claims**

1. A composition for removing calcium sulfate scale deposits from surfaces consisting essentially of an aqueous solution of

about one weight percent to maximum solubility of a polyamino carboxylic acid selected from the group consisting of ethylenediamine tetracetic acid, nitrilo triacetic acid, diethylenetriamine pentaacetic acid, N-hydroxyethylethylenediamine triacetic acid, and mixtures thereof,

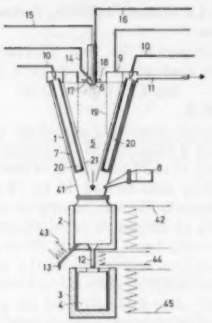
a minimum of about one mole of a soluble carbonate per mole of said polyamino carboxylic acid, said carbonate being selected from the group consisting of $(NH_4)HCO_3$, $NaHCO_3$, $KHCO_3$, Na_2CO_3, K_2CO_3, $(NH_4)_2CO_3$, and mixtures thereof,

and from about 0.005 to 0.01 weight percent of an anionic fluorocarbon surfactant selected from the group consisting of compounds of the formulas $F(CF_2CF_2)_n(CH_2)_2S(CH_2)_2COOLi$ and $[F(CF_2CF_2)_n(CH_2)_2O]_xPO(ONH_4)_y$, where n = 3, 4 or 5, x = 1 or 2, and y = 2 or 1.

4,144,186
METHOD AND APPARATUS FOR PROCESSING AQUEOUS RADIOACTIVE WASTES FOR NONCONTAMINATING AND SAFE HANDLING, TRANSPORTING AND FINAL STORAGE

Stefan Drobnik, Stutensee-Spöck; Werner Hild, Hochstetten; Friedrich Kaufmann, Karlsruhe, and Herbert Koschorke, Stutensee-Friedrichstal, all of Fed. Rep. of Germany, assignors to Gesellschaft für Kernforschung m.b.H, Karlsruhe, Fed. Rep. of Germany

Filed Mar. 7, 1977, Ser. No. 775,288
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1976, 2609299
Int. Cl.[2] G21F *9/14, 9/16*
U.S. Cl. 422—159 **9 Claims**



1. Apparatus for processing aqueous radioactive wastes for noncontaminating and safe handling, transport and final storage wherein nitric acid and/or nitrate containing aqueous radioactive waste solutions are continuously denitrated with formic acid, spray-dried and calcinated, the resulting calcinate is mixed with glass former substances, the mixture is melted and the melt is caused to solidify into a glass, glass ceramic or glass ceramic-like block and the waste gases produced during denitration, drying and calcination are conducted through a filter system in order to remove solid particles that have been carried along by the gas, comprising:

(a) a downwardly open vessel having

(i) a spray nozzle in its interior, said spray nozzle being provided with an inlet for the waste solution, with an inlet for the formic acid and with an inlet for atomizer steam, and further includes in the area of its lower end an inlet and an outlet for a coolant.

(ii) a filter system arranged around said spray nozzle,

(iii) a metering device to measure out glass frits or glass former substances,

(iv) a steam inlet for introducing rinsing steam into the filter system, and

(v) a waste gas outlet connected to the filter system;

(b) a heatable melting crucible disposed below and releasably connected with said vessel and provided with a heatable outlet stud and a heatable sample-taking device; and

(c) a heatable chill mold carrier disposed below the melting crucible to accommodate a chill mold.

4,144,187

CONSTANT BOILING ADMIXTURES

William M. Hutchinson, deceased, late of Bartlesville, Okla., and by Florence M. Hutchinson, executrix, Claremore, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 783,243, Mar. 31, 1977, Pat. No. 4,097,398, which is a division of Ser. No. 690,807, May 27, 1976, Pat. No. 4,039,465, which is a division of Ser. No. 602,353, Aug. 6, 1975, Pat. No. 4,024,086. This application Dec. 28, 1977, Ser. No. 865,161

Int. Cl.[2] C23G *5/02*

U.S. Cl. 252—364 **3 Claims**

1. A substantially constant boiling admixture of (A) 1,1,2-trifluoroethane and (B) trichlorofluoromethane wherein said (A) represents about 59.9 weight percent, and said (B) about 40.1 weight percent at substantially atmospheric pressure.

4,144,188

TABLET FOR PREVENTING DETERIORATION OF A WATER-SOLUBLE CUTTING LIQUID

Kozo Sato, No. 7-12, Minami-3-chome, Yamamoto-cho, Yao-shi, Osaka-fu, Japan

Continuation-in-part of Ser. No. 713,873, Aug. 12, 1976, abandoned. This application Dec. 9, 1977, Ser. No. 859,103

Int. Cl.[2] C23F *11/14*

U.S. Cl. 252—389 R **2 Claims**

1. A tablet which gradually dissolves in a water-soluble cutting liquid over a long period for preventing deterioration thereof comprising 15 to 25 weight % of mixed primary amides of at least one fatty acid having 15 to 18 carbon atoms per molecule and a naphthenic acid having 10 to 12 carbon atoms per molecule, 5 to 15 weight % of ethylenediaminetetraacetic acid tetrasodium salt, 5 to 15 weight % of at least one boric acid ester of an alcohol selected from the group consisting of methyl alcohol and ethyl alcohol, 30 to 50 weight % of at least one fatty acid derivative selected from the group consisting of fatty acid esters of an alcohol selected from the group consisting of lower alkyl alcohols, saccharose, pentaerithritol, dipentaerithritol and tripentaerithritol and salts of at least one alkanolamines having 2 to 9 carbon atoms per molecule, the precursory fatty acid of the fatty acid derivative having 15 to 18 carbon atoms per molecule, and 10 to 15 weight % of a nitrite of at leat one alkali metal selected from the group consisting of sodium and potassium.

4,144,189

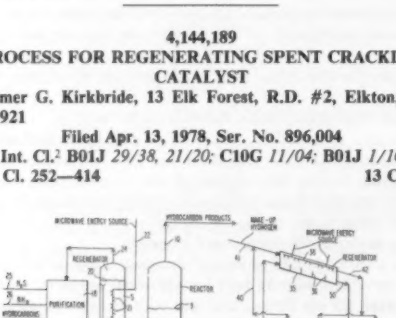
PROCESS FOR REGENERATING SPENT CRACKING CATALYST

Chalmer G. Kirkbride, 13 Elk Forest, R.D. #2, Elkton, Md. 21921

Filed Apr. 13, 1978, Ser. No. 896,004

Int. Cl.[2] B01J *29/38, 21/20;* C10G *11/04;* B01J *1/10*

U.S. Cl. 252—414 **13 Claims**



1. Process for regenerating deactivated cracking catalyst which has become deactivated in a hydrocarbon cracking process which comprises subjecting a mixture of deactivated cracking catalyst and hydrogen to microwave energy at a temperature of from 700° F. to 950° F. for a time of not more than ten minutes, and reusing the regenerated catalyst in said hydrocarbon cracking process.

8. Process for regenerating fluidized cracking catalyst deactivated by coke formed in a hydrocarbon cracking operation which comprises fluidizing the deactivated catalyst with hydrogen and subjecting the fluidized catalyst-hydrogen mixture to microwave energy wherein said microwave energy is composed of at least two different microwave frequencies, wherein the temperature is from 700° F. to 950° F. and the time of subjecting said mixture to microwave energy is from fifteen seconds to three minutes, and returning regenerated catalyst to said hydrocarbon cracking operation.

4,144,190

POLYSACCHARIDE-CONTAINING ADSORBENT

Quentin Bowes, Rheinfelden; Jaroslav Haase, Riehen, and Rudolf F. Wurster, Pfeffingen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Jun. 28, 1977, Ser. No. 810,838

Claims priority, application Luxembourg, Jul. 8, 1976, 75329; Oct. 3, 1976, 76120

Int. Cl.[2] C02B *1/46, 1/52*

U.S. Cl. 252—427 **15 Claims**

1. An adsorbent which has been manufactured from

(1) a cellulose material, a reaction product of

(2) a basic, nitrogen-containing polymer selected from the group consisting of a polyalkyleneimine having an average molecular weight of 5,000 to 200,000, a polyamidopolyamine from a polycarboxylic acid containing 2 to 10 carbon atoms and a polyamine, a polyamidopolyamine from a polymeric fatty acid and a polyamine and a polyamide resin which has been obtained by reacting an epihalogenohydrin with an aminopolyamide from a polyalkyleneamine and an aliphatic dicarboxylic acid containing 2 to 10 carbon atoms, and

(3) a halogenoacetic acid, which is unsubstituted or substituted in the α-position by lower alkyl, lower alkoxy, hydroxy-lower alkyl, lower alkoxy-lower alkyl, lower alkylthio-lower alkyl, carboxy-lower alkyl, phenyl or benzyl, and

(4) a crosslinking agent selected from the group consisting of

a. a halogeno-diazine or halogenotriazine containing at least two mobile substituents,

b. a 2-halogeno-benzothiazole-carboxylic acid halide or -sulphonic acid halide or a 2-halogeno-benzooxazole-carboxylic acid halide or -sulphonic acid halide,

c. a halogeno-6-pyridazonyl-1-alkanoyl halide or a halogeno-6-pyridazonyl-1-benzoyl halide,

d. an anhydride or halide of an aliphatic, α,β-unsaturated monocarboxylic or dicarboxylic acid,

e. an anhydride or halide of an aliphatic monocarboxylic or dicarboxylic acid or of an aromatic carboxylic acid containing two mobile halogen atoms,

f. a carboxylic acid N-methylolamide, N-chloromethylamide or N-bromomethylamide,

g. an unetherified or etherified N-methylolurea or N-methylolmelamine and

h. a condensation product of a diarylalkane containing at least one phenolic hydroxyl group and a halogenohydrin, or a glycerol triglycidyl ether.

4,144,191

AMINE-RESIN SUPPORTED RHODIUM-COBALT CARBONYL BIMETALLIC CLUSTERS AS NOVEL HYDROFORMYLATION CATALYSTS

George E. Hartwell, Framingham, and Philip E. Garrou, Hollis-ton, both of Mass., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 6, 1977, Ser. No. 803,815
Int. Cl.[2] B01J *31/06, 31/28*
U.S. Cl. 252—428 20 Claims

1. A catalyst consisting essentially of a rhodium-cobalt carbonyl bimetallic cluster loaded on an amine resin.

4,144,192

DEHYDROCHLORINATION CATALYST

Arthur E. Reinhardt, III, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 18, 1977, Ser. No. 852,897
Int. Cl.[2] B01J *27/24, 21/08;* C07C *21/00*
U.S. Cl. 252—438 2 Claims

1. A catalyst for use in catalyzing vapor phase dehydrochlorination of 1,1,2-trichloroethane to produce vinylidene chloride comprising cesium nitrate deposited on particulate support material, said catalyst having a cesium nitrate content of from 0.5 to 25 percent by weight based on the combined weight of cesium nitrate and support material wherein the support material is silica gel having a BET surface area of at least 500 square meters per gram, an average pore diameter of between 10 and 100 angstroms, a particle size in the range of from 6 to 200 mesh, and a silica content of at least 99.5 percent by weight on an anhydrous basis, said silica gel having been humidified, prior to depositing cesium nitrate thereon, by contacting the silica gel with water vapor at a temperature between 5° C. and 50° C.

4,144,193

GRANULAR ACTIVATED CARBON MANUFACTURE FROM SUB-BITUMINOUS COAL TREATED WITH DILUTE INORGANIC ACID

Hari N. Murty, Grand Island, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 818,700, Jul. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 578,061, May 16, 1975, abandoned. This application Mar. 6, 1978, Ser. No. 884,084
Int. Cl.[2] B01J *21/18;* C01B *31/12, 31/10*
U.S. Cl. 252—444 27 Claims

1. A process for making hard granular activated carbon having a minimum abrasion number of about 70 comprising:

forming granules from sub-bituminous coal;

treating the granules with a dilute aqueous solution of inorganic acid at a concentration from about 1 to about 25% by weight to reduce the volatile content and thereby increase the fixed carbon content comprising: mixing the granules with the acid for a time and at a temperature and solution to coal ratio sufficient to eliminate subsequent charring, washing off the acid, and drying the granules at least partially to a moisture content below about 25% by weight;

mixing the treated granules with 0% to about 15% by weight of a carbonaceous binder;

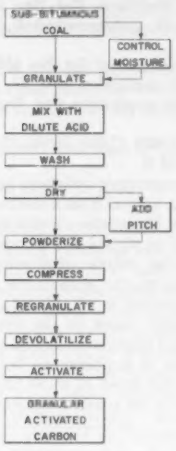
reducing the treated granules to form fine powder;

compressing the powder to form shapes;

reducing the shapes to reform granules;

devolatilizing the reformed granules, without charring, by directly heating to and at a temperature higher than the charring temperature in an oxygen-free atmosphere; and

activating the devolatilized granules by heating to and at a temperature higher than the devolatilizing temperature in an atmosphere containing a gaseous activating agent.



5. The process of claim 1 wherein the acid is H_3PO_4, and the overall yield is not less than about 26% by weight, dry basis.

4,144,194

ZEOLITE PROMOTED HYDROCARBON CONVERSION CATALYSTS

Hanson L. Guidry, Bel Air, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 350,186, Apr. 11, 1973, abandoned, which is a continuation-in-part of Ser. No. 230,159, Feb. 28, 1972, abandoned, which is a continuation of Ser. No. 23,013, Mar. 26, 1970, abandoned. This application Nov. 7, 1974, Ser. No. 521,819
Int. Cl.[2] B01J *29/06, 29/00*
U.S. Cl. 252—451 4 Claims

1. A method for preparing a zeolite promoted hydrocarbon cracking catalyst comprising a zeolite dispersed in an inorganic matrix, which comprises:

(a) preparing an alkali metal faujasite having a silica-alumina ratio of from about 3.0 to 6.0 by reacting silicate, aluminate, in aqueous alkali metal hydroxide solution to obtain a reaction mixture containing zeolite crystals suspended in an aqueous solution of mother liquor which contains 25 to 50 gms. per liter Na_2O and 50 to 100 gms. per liter SiO_2 dissolved therein,

(b) separating the zeolite from its mother liquor,

(c) combining the mother liquor with additional silicate, and a desired quantity of clay, and then gelling by lowering pH thereof to from about 12.0 to 10.5 by the addition of carbon dioxide or mineral acid;

(d) adding a sufficient quantity of sodium aluminate to the reactant mixture to provide from about 5 to 40% of the alumina present in the matrix of the finished catalyst;

(e) aging the gelled silicate mixture for a period of from about 15 to 60 minutes at a temperature of 70° to 125° F.;

(f) adding an aluminum salt to the aged mixture and adjusting the pH to from about 5.5 to 7.5;

(g) adding sodium Y-type zeolite to the gelled reaction mixture;

(h) washing said composition to remove soluble impurities;

(i) exchanging said composition with a solution of rare earth ions having a pH of 4.5 to 5.25; and

(j) recovering the catalyst product.

4,144,195

HIGH TEMPERATURE RESISTANT, HEAT INSULATING CERAMIC MATERIAL

Johann Siebels, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 615,492, Sep. 22, 1975, abandoned. This application Mar. 23, 1977, Ser. No. 780,361

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1974, 2445468

Int. Cl.[2] **C04B** *35/10, 35/00, 35/16;* **B01J** *29/06*

U.S. Cl. 252—455 R **8 Claims**

1. A high temperature resistant, heat insulating, sintered, ceramic material formed from a starting mixture comprising a mixture of 30 to 60 volume percent aluminum oxide powder (Al_2O_3) and 70 to 40 volume percent alumina-silica fibers, based on the total volume of aluminum oxide powder and alumina-silica fibers, the alumina-silica fibers in the starting mixture being present in an amount of from about 10 to 28 percent by weight, based on the total weight of aluminum oxide powder and alumina-silica, said powder and fibers being sintered together at temperatures between about 1200° and about 1550° C. for about 10 to 50 hours so that α-aluminum oxide is present in the sintered material.

4,144,196

ADSORBENT FOR USE IN DOUBLE GLAZED WINDOWS

Richard J. Schoofs, 1605 School St., P.O. Box 67, Moraga, Calif. 94556

Filed Aug. 11, 1975, Ser. No. 603,267

Int. Cl.[2] **B01J** *29/06;* **E04B** *2/28*

U.S. Cl. 252—455 Z **2 Claims**

1. An adsorbent for use in sealed insulated glass to prevent condensation on the interior surfaces of the insulating glass consisting essentially of a mixture of a particulate molecular sieve zeolite having an average pore diameter which permits entry of water molecules into the pore space and prevents entry of nitrogen and oxygen into the pore space and a particulate non-zeolitic adsorbent having a strong affinity for hydrocarbon adsorption and an average pore diameter which permits entry of benzene molecules into the pore space.

2. The adsorbent mixture defined in claim 1 wherein the mixture consists essentially of 15 to 75% by weight of Type 3A molecular sieve zeolite and the remainder is silica gel or activated alumina and wherein both components of the mixture are particles within the range about 10 to 30 mesh.

4,144,197

DEHYDROGENATION CATALYST

Gregor H. Riesser, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 787,646, Apr. 14, 1977, abandoned. This application Apr. 24, 1978, Ser. No. 899,055

Int. Cl.[2] **B01J** *23/10, 23/78, 23/84, 23/88*

U.S. Cl. 252—462 **11 Claims**

1. A catalyst for the dehydrogenation of hydrocarbons to more unsaturated hydrocarbons comprising a mixture having:

(a) from about 14 to about 67 percent by weight of an iron oxide, measured as iron metal;

(b) from about 2 to about 25 percent by weight of potassium oxide, measured as potassium metal;

(c) from about 0.005 to about 5 percent by weight of a vanadium oxide, measured as vanadium metal;

(d) from about 0.006 to about 16 percent by weight of a heavy metal oxide selected from the group consisting of molybdenum oxide, tungsten oxide and mixtures thereof, measured as the metal;

(e) from about 0.008 to about 43 percent by weight of a cerium oxide, measured as cerium metal;

(f) from 0 to about 40 percent by weight of a cobalt oxide measured as cobalt metal; and

(g) from 0 to about 21 percent by weight of a chromium oxide, measured as chromium metal.

4,144,198

PROCESS FOR PREPARATION FOR COPPER-IRON-ALUMINUM CATALYSTS AND CATALYSTS PREPARED BY THE PROCESS

Bunji Miya; Yuzi Sawamoto; Kunizo Hashiba, and Shizuo Hisamitsu, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1977, Ser. No. 863,131

Claims priority, application Japan, Jan. 25, 1977, 52-7051

Int. Cl.[2] **B01J** *21/04, 23/72, 23/74*

U.S. Cl. 252—466 J **5 Claims**

1. A process for preparing copper-iron-aluminum catalysts, which comprises dissolving a cupric salt, a ferrous salt and an aluminum salt in water in proportions such that the solution contains 1.4 to 2.5 iron atoms and 0.4 to 1.2 aluminum atoms per one atom of copper, adding an alkali to the solution at a temperature higher than 60° C. and lower than the boiling point of the solution until the pH of the solution is in the range of from 9.5 to 11.8 to form a precipitate, separating the precipitate and then water-washing, drying, calcining and pulverizing the separated precipitate.

4,144,199

SAFRANIC ACID ESTER PERFUME COMPOSITIONS

Hans J. Wille; Wilhelmus M. B. Konst, both of Naarden, and Jan Kos, Huizen, all of Netherlands, assignors to Naarden International, N.V., Naarden, Netherlands

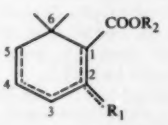
Continuation of Ser. No. 551,553, Feb. 21, 1975, abandoned. This application Jul. 6, 1977, Ser. No. 813,322

Claims priority, application United Kingdom, Feb. 22, 1974, 08166/74

Int. Cl.[2] **C11B** *9/00*

U.S. Cl. 252—522 **4 Claims**

1. A process for the preparation of a perfume composition which comprises the incorporation of one or more esters having the formula



wherein the dotted lines represent two conjugated double bonds in the position 2 endocyclic and 4(α-isomer), 1 and 3 (β-isomer) or 2-exocyclic and 3(γ-isomer) and wherein R_1 represents an alkyl group or, in the γ-isomers and alkylidene group, with 1–3 carbon atoms and R_2 represents an alkyl or alkenyl group with 1–4 carbon atoms as a perfuming agent in a quantity of at least 0.5 ppm based on the final perfume composition to impart a herbal, spicy or fruity note with other constituents suitable for inclusion in such products.

4,144,200

3-PHENYL-CYCLOPENT-2-EN-1-ONE IN PERFUME COMPOSITIONS

Erling Sundt, Vessy, and Roland Aschiero, Bernex, both of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

Filed Apr. 14, 1978, Ser. No. 896,440

Claims priority, application Switzerland, May 6, 1977, 5689/77

Int. Cl.[2] **C11B** *9/00*

U.S. Cl. 252—522 **2 Claims**

1. A method for improving, enhancing or modifying the fragrance of a perfume composition which method comprises adding thereto an effective amount of 3-phenyl-cyclopent-2-en-1-one.

4,144,201

LIQUID DETERGENT COMPOSITIONS HAVING IMPROVED DRAIN-DRY AND MILDNESS PROPERTIES

Peter Winterbotham, Wirral, and Jeffrey D. Hampson, Birkenhead, both of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Nov. 3, 1977, Ser. No. 848,438

Claims priority, application United Kingdom, Nov. 5, 1976, 46193/76

Int. Cl.[2] C11D 1/14, 1/83

U.S. Cl. 252—547 9 Claims

1. An aqueous liquid cleaning composition, which is free of alkyl benzene sulphonates, alkyl sulphonates and alkyl sulphates, and comprising:

a. 5 to 35% by weight of said composition of a C_8–C_{24} alkylether sulphate having 1 to 10 alkylene oxide groups,

b. 5 to 35% by weight of said composition of a nonionic detergent active compound selected from the group consisting of amine oxides having the general formula $RR_1R_2N \rightarrow O$ wherein R is a straight or branched chain aliphatic hydrocarbon radical which may be saturated or unsaturated having 8 to 20 carbon atoms, and R_1 and R_2 are methyl, ethyl, hydroxymethyl or hydroxyethyl groups, and mixtures of said amine oxides and nonionic alkylene oxide condensation products.

c. 0.25 to 5.0% by weight of soluble casein.

4,144,202

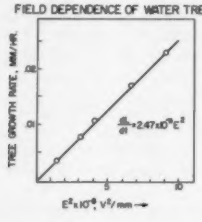
DIELECTRIC COMPOSITIONS COMPRISING ETHYLENE POLYMER STABILIZED AGAINST WATER TREEING WITH EPOXY CONTAINING ORGANO SILANES

Arnold C. Ashcraft, Hightstown; Robert J. Turbett, Millington, and Timothy R. Burke, Kendall Park, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

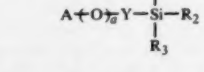
Filed Dec. 27, 1977, Ser. No. 864,750

Int. Cl.[2] H01B 3/30

U.S. Cl. 252—63.2 13 Claims



1. A dielectric composition comprising ethylene polymer and effective amounts, as a water treeing inhibitor, of at least one organo silane of the following formula:



wherein A is an epoxy containing radical; Y is C_1 to C_8 alkylene; R_1 is C_1 to C_8 alkyl, C_1 to C_8 alkoxy, C_1 to C_8 acyloxy, C_6 to C_{18} aryloxy or substituted aryloxy; R_2 and R_3 are independently selected from C_1 to C_8 alkoxy, C_1 to C_8 acyloxy, C_6 to C_{18} aryl or substituted aryl; C_6 to C_{18} aryloxy or substituted aryloxy; a is an integer of 0 or 1.

4,144,203

PROCESS FOR THE PREPARATION OF CHLORINATED POLYMERS

Klaus Hoehne; Johann Jelen; Diez Heine, all of Leverkusen, and Rolf Baatz, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 685,313, May 11, 1976, abandoned, which is a continuation of Ser. No. 526,578, Nov. 25, 1974, abandoned. This application May 24, 1976, Ser. No. 689,684

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1973, 2359461

Int. Cl.[2] C08F 8/22

U.S. Cl. 260—3.3 2 Claims

1. A process for preparing a chlorinated aliphatic polymer which comprises chlorinating a chlorine free polymer selected from the group consisting of natural rubber, polyisoprene, polybutadiene, polyethylene, polypropylene and ethylene-propylene copolymer in a chlorinated hydrocarbon solvent with gaseous chlorine as the chlorinating agent, adding to the chlorinated reaction mixture from 2 to 25% by weight, based on the chlorinated polymer, of at least one member selected from the group consisting of alkyd resins, urethane-formaldehyde resins, melamine-formaldehyde resins, urea-formaldehyde resins, polymers and copolymers of alkylacrylates and methacrylates, aldehyde and ketone resins, silicone resins, cellulose derivatives, and hydrocarbon resins and then isolating chlorinated aliphatic polymer from the chlorinated reaction mixture by steam distillation.

4,144,204

IMPACT-RESISTANT THERMOPLASTIC MOLDING COMPOSITIONS WITH INCREASED STRESS CRACK RESISTANCE

Hans Mittnacht, Weinheim; Adolf Echte, Ludwigshafen; Helmut Jenne, Schriesheim; Manfred Lieb, Ludwigshafen; Klaus Bronstert, Carlsberg, and Hansjoerg Adler, Bonndorf, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 14, 1976, Ser. No. 686,367

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1975, 2525019

Int. Cl.[2] C08L 7/00, 25/04, 9/00

U.S. Cl. 260—4 AR 10 Claims

1. A thermoplastic molding composition consisting essentially of a rubber-modified polymer of a monovinyl-aromatic compound, said rubber-modified polymer being impact resistant and having improved stress-crack resistance and having been obtained by the polymerization of the monovinyl-aromatic compound in the presence of the rubber, said composition having as the disperse phase in the continuous phase consisting essentially of the poly(vinyl aromatic) polymer a soft component composed of particles of graft copolymers of the rubber and said polymer of said monovinyl-aromatic compound and also part of said polymer of said monovinyl-aromatic compound which has been mechanically occluded in the rubber particles during the said polymerization and said soft component further being the toluene-insoluble constituent of said rubber-modified polymer, minus any pigment which may be present, in which molding composition

(1) the proportion of soft component dispersed in the rubber-modified polymer is at least 28% up to 60% by weight, based on the said polymer,

(2) the particles of the disperse soft component phase in the rubber-modified polymer have a mean diameter, as determined by weight average, of 4μ up to 10μ,

(3) the swelling index of the soft component in toluene is greater than 9.5 and

(4) the tensile strength of the thermoplastic molding composition, measured on a compression-molded dumbbell-shaped bar by the Deutches Industrie-Norm 53,455 tensile test, is at least 5% above the corresponding yield strength.

4,144,205

BARK EXTENDED PHENOLIC RESIN ADHESIVE COMPOSITION AND PROCESS FOR PREPARING SAME

Seymour Hartman, Mahopac, N.Y., and Mulayim Ozkan, Waterbury, Conn., assignors to Champion International Corporation, Stamford, Conn.

Filed Feb. 18, 1977, Ser. No. 769,917

Int. Cl.[2] C08L *61/14, 89/00*

U.S. Cl. 260—7 **3 Claims**

1. A process for preparing a bark-extended phenol-aldehyde resin adhesive composition for bonding wood plies, said composition having a total resin solids proportion of approximately 24.6% and a viscosity of approximately 2,100 cps., said process comprising the steps of:

preparing a pre-mix by combining:
bark, 43 parts
sodium hydroxide (50% solution), 43
water, 172

said mixture creating an exothermic reaction;
mixing said pre-mix until the exotherm subsides;
adding to said pre-mix:
water; 288 parts
Norprofil; 107
wheat flour, 50 parts
phenolic resin, 150 parts
mixing said components;
then adding:
sodium hydroxide (50% solution), 9 parts
mixing said components;
then adding:
soda ash, 20 parts
mixing said components;
then adding:
phenolic resin, 750 parts
and mixing said components;
said phenolic resin being a low molecular weight aqueous alkaline phenol-aldehyde resin having a low degree of polymerization, said resin further being soluble in all proportions in ethanol.

4,144,206

STATIC DISSIPATING HEAT CURABLE SILICONE RUBBER COMPOSITIONS

Gerald E. Symeon, Racine, Wis., assignor to General Electric Company, Waterford, N.Y.

Filed Jan. 13, 1978, Ser. No. 869,085

Int. Cl.[2] C08L *1/00*

U.S. Cl. 260—9 **22 Claims**

1. A static dissipating heat curable silicone rubber composition comprising (1) 100 parts by weight of diorganopolysiloxane polymer having a viscosity varying from 1,000,000 to 200,000,000 centipoise at 25° C. where the organo group is selected from the class consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals; (2) from 5 to 150 parts by weight of a filler; (3) from 0.1 to 10 parts by weight of a peroxide curing catalyst; and (4) from 0.1 to 1.5 parts by weight of a polyether polysiloxane copolymer additive of the formula,

$$A_w B_v$$

where A is the polysiloxane moiety and B is the polyether moiety where w is a whole number varying from 1 to 100 and v is a whole number varying from 1 to 200.

10. The composition of claim **1** wherein the filler is selected from the class consisting of fumed silica, precipitated silica, titanium dioxide, lithopone, zinc oxide, zirconium silicate, silica aerogel, iron oxide, diatomaceous earth, calcium carbonate, glass fibers, magnesium oxide, chronic oxide, zirconium oxide, aluminum oxide, alpha quartz, calcined clay and cork.

4,144,207

COMPOSITION AND PROCESS FOR INJECTION MOLDING CERAMIC MATERIALS

Roger W. Ohnsorg, Niagara Falls, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed Dec. 27, 1977, Ser. No. 864,415

Int. Cl.[2] C08L *91/00*

U.S. Cl. 260—23 S **12 Claims**

1. A ceramic composition suited to be injection molded comprising:

a. at least about 65 percent by weight of finely-divided sinterable carbide ceramic material,
b. from about 0.2 to about 5.0 percent by weight of a sinterable aid containing boron or beryllium, selected from the group consisting of elemental beryllium, beryllium compounds, elemental boron, boron compounds, and mixtures thereof,
c. from about 14 to about 30 percent by weight of a mixture of thermoplastic resin having a volatization temperature between about 100° and about 500° and at least one wax or oil component having a lower volatization temperature than said resin.

4,144,208

COLD CROSS-LINKING DISPERSION ADHESIVE

Gundolf Fuchs, Hemmingstedt; Heiko Humbert, Hamburg, and Dietrich Pirck, Seevetal, all of Fed. Rep. of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Aug. 15, 1977, Ser. No. 824,635

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1976, 2636863

Int. Cl.[2] C08J *3/24*

U.S. Cl. 260—27 R **3 Claims**

1. Cold cross-linking polyacrylic acid esters-based adhesive composition comprising an aqueous dispersion of about 40 to 60 percent weight solids content with a viscosity of about 800 to 1000 pcs, containing

(a) a copolymer prepared from, in wt.%, 85-62 2-ethylhexylacrylate, 0–20 n-butylacrylate, 8–12 acrylonitrile, 2–6 acrylic acid, 0.5–2 acrylamide, and 0 to 2 hydroxyalkylmethacrylate, and
(b) 1-5 wt.%, based on the copolymer, of an acetoacetic acid ester cross-linking agent having at least one acetocetic ester group, derived from esterifica with C_2 to C_6 diols or 1,1,1-tris(acetoacetoxy-methyl alkanes wherein in the alkane group contains from 3 to 7 carbon atoms.

4,144,209

RESIN LATEX COMPOSITIONS

Arthur H. Drelich, Plainfield, and George J. Lukacs, Perth Amboy, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Continuation of Ser. No. 566,462, Apr. 9, 1975, abandoned, which is a continuation of Ser. No. 462,290, Apr. 19, 1974, abandoned, which is a division of Ser. No. 328,555, Feb. 1, 1973, Pat. No. 3,889,024. This application Nov. 12, 1975, Ser. No. 631,012

Int. Cl.[2] C08L *31/04, 101/04, 101/08*

U.S. Cl. 260—29.2 M **9 Claims**

1. A stable aqueous resin composition having controlled migration, diffusion, penetration, and spread properties when applied to nonwoven textile fabrics comprising from about 0.1% to about 60% by weight on a solids basis of a high molecular weight synthetic resin in latex form prepared by the emulsion polymerization of an ethylenically unsaturated monomer or a mixture of two or more ethylenically unsaturated monomers and from about 0.01% by weight to about 6% by weight, based on the weight of said synthetic resin, of an aluminum chlorhydroxide complex migration control agent selected from the group consisting of: (a) aluminum chlorhydroxide; (b) reaction products of aluminum chlorhydroxide and polyhy-

droxy compounds; (c) reaction products of aluminum chlorhydroxide and monocarboxylic acids; and (d) mixtures thereof.

4,144,210

WATER-SOLUBILIZED RESIN COMPOSITION

Yuzuru Noda; Mitsuo Yoshihara, and Toshio Takigawa, all of Ibaraki, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaraki, Japan

Filed Jun. 30, 1977, Ser. No. 811,923

Claims priority, application Japan, Oct. 6, 1976, 51-120536

Int. Cl.[2] C08G *69/44, 73/14, 73/16*

U.S. Cl. 260—29.2 N **13 Claims**

1. A water-solubilized resin composition obtained by mixing a water-solubilized resin solution comprising a volatile nitrogenous base salt of a polyimide precursor containing an amino group at both terminals of the molecule and having a residual acid value ratio of about 50 to about 5%, said polyimide precursor being obtained by reacting 1,2,3,4-butanetetracarboxylic acid and a molar excess of a diamine as monomer units in water, in a water-soluble solvent or in both a water-soluble solvent and water; with a water-solubilized compound comprising a volatile nitrogeneous base salt of a 3,3'-diester, a 3,4'-diester or a 4,4'-diester of a 3,3', 4,4'-benzophenonetetracarboxylic acid.

4,144,211

NOVEL COMPLEXES OF POLYOXAZOLINES OR POLYOXAZINES AND HALOGENS, INTERHALOGENS OR PSEUDO-HALOGENS AND PROCESS FOR PREPARING SAME

Thomas A. Chamberlin, and Sonia W. Bangs, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 6, 1977, Ser. No. 830,529

Int. Cl.[2] C08L *79/04;* **C08G** *73/06*

U.S. Cl. 260—29.2 R **14 Claims**

1. A solid complex comprising (a) a poly-2-oxazoline or poly-2-oxazine, and (b) a halogen, interhalogen or pseudohalogen.

4,144,212

AIR-CURING COPOLYMER LATICES

Seymour M. Linder, Baltimore, and John W. Calentine, Pasadena, both of Md., assignors to Alcolac Inc., Baltimore, Md.

Filed Mar. 6, 1978, Ser. No. 883,505

Int. Cl.[2] C08F *220/40*

U.S. Cl. 260—29.7 H **8 Claims**

1. An air-curing copolymer latex comprising an aqueous dispersion of a copolymer of a mixture of copolymerizable monomers, consisting essentially, in % by weight based on the total weight of monomers used, of:

(a) about 1% to about 20% of dicyclopentadienyl acrylate or dicyclopentadienyl methacrylate;

(b) about 99% to about 20% of an alkyl acrylate or alkyl methacrylate, including mixtures thereof, in which the alkyl groups contain from 1 to 4 carbon atoms;

(c) about 0% to about 5% of acrylic acid or methacrylic acid;

(d) about 0% to about 40% of other acrylic monomers selected from the group consisting of higher alkyl acrylates and alkyl methacrylates in which the alkyl groups contain from 5 to 18 carbon atoms, acrylamide, methacrylamide, diacetone acrylamide, acrylonitrile and methacrylonitrile; and:

(e) about 0% to about 80% of other monoethylenically unsaturated monomers which are copolymerizable with (a), (b), (c) and (d);

the above comonomers constituting essentially 100% by weight of the total monomers in said copolymer.

4,144,213

STABILIZATION OF ORGANIC AMIDE SOLVENTS AND POLYMER SOLUTIONS THEREOF

Tad L. Patton, Baytown, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed May 17, 1977, Ser. No. 797,842

Int. Cl.[2] C08G *5/42, 5/20, 71/00*

U.S. Cl. 260—30.2 **29 Claims**

1. A solution of polymers in an organic amide solvent stabilized against degradation in the presence of amines, containing dissolved therein a stabilizing amount of an aromatic sulfonic acid ester of an aliphatic, arylaliphatic or alicyclic alcohol, the polymers being selected from the group consisting of polyparabanic acids, poly(iminoimidazolidinediones), polyimides, and polyhydantoins.

4,144,214

EXTENSIBLE FILMS FOR PACKAGING FOODSTUFFS

Carlo Corbacella, Ferrara, Italy, assignor to Montedison S.p.A., Milan, Italy

Filed Oct. 18, 1977, Ser. No. 843,327

Claims priority, application Italy, Oct. 19, 1976, 28484 A/76

Int. Cl.[2] C08K *5/01;* **C08L** *23/06, 23/16*

U.S. Cl. 260—23 H **4 Claims**

1. Extensible films for packaging, having a thickness comprised between 10 and 40 microns and consisting of a mixture comprising the following components:

(a) from 70 to 95 parts by weight of a polyethylene having a density of 0.918 to 0.925;

(b) from 30 to 5 parts by weight of an amorphous ethylene/-propylene copolymer, having a Mooney viscosity at 100° C. comprised between 20 and 60;

(c) from 0.1 to 1 part by weight, on 100 parts by weight of (a) + (b), of at least one monoglyceride of fatty acid containing, with reference to the fatty acid, from 12 to 25 carbon atoms in the chain; and

(d) from 0.1 to 0.5 parts by weight, on 100 parts by weight of (a) + (b), of paraffin oil.

4,144,215

BINDERS FOR FOUNDRY MIXES COMPRISING POLYISOCYANATE AND STYRENE-ALLYL ALCOHOL COPOLYMER OR ALKYLENE OXIDE DERIVATIVE THEREOF

Arek Khachaturian, Birmingham, Mich., assignor to International Minerals & Chemical Corp., Libertyville, Ill.

Filed Jun. 21, 1978, Ser. No. 917,700

Int. Cl.[2] C08K *5/06, 5/10*

U.S. Cl. 260—31.2 N **13 Claims**

1. A foundry core mix comprising a foundry aggregate and about 0.5% to 5% by weight of the aggregate of a binder comprising in admixture:

(a) a curable resin gase of styrene-allyl alcohol copolymer or alkylene oxide adduct thereof, and

(b) a reactive liquid polyisocyanate in the amount of 50–150% by weight of the resin base.

4,144,216

ROOM TEMPERATURE VULCANIZABLE ORGANIC SOLVENT DISPERSIONS OF SILICONE ELASTOMERS

William H. Clark, and Charles E. Skinner, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed May 19, 1975, Ser. No. 578,706

Int. Cl.[2] C08K *5/02, 5/07, 5/09*

U.S. Cl. 260—31.2 R **10 Claims**

1. A silicone elastomeric composition obtained by mixing ingredients consisting essentially of

(A) 100 parts by weight of a benzene soluble hydroxyl endblocked polydimethylsiloxane having a viscosity of at least 100,000 cps. at 25° C.

(B) from 5 to 75 parts by weight of a soluble ethylpolysilicate,
(C) from 1 to 20 parts by weight of monoorganotriacetoxysilane wherein the organic radical is an alkyl radical of less than four carbon atoms,
(D) from 0.1 to 2 parts by weight of organotin carboxylate,
(E) from 10 to 150 parts by weight of an extending filler, and
(F) sufficient organic solvent to provide a solvent content of from 10 to 95 weight percent solvent based on the total weight of the composition, said organic solvent being selected from the group consisting of aliphatic hydrocarbons, chlorinated aliphatic hydrocarbons, aromatic hydrocarbons, ketones, esters, ethers and mixtures thereof wherein said organic solvent is a solvent for the silicon containing species and alcohol does not exceed 40 weight percent of the total solvent, the combined parts by weight of (B) and (C) being from 8 to 80 parts by weight based on 100 parts by weight of (A) and the weight ratio of (B) to (C) being from 0.6 to 40.

4,144,217

PLASTICIZER BLENDS FOR POLYVINYL BUTYRAL INTERLAYERS

James A. Snelgrove, Monson, and Donald I. Christensen, East Longmeadow, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 30, 1978, Ser. No. 873,346
Int. Cl.[2] C08K *5/12*
U.S. Cl. 260—31.8 W **7 Claims**

1. A polyvinyl butyral interlayer for a laminated glazing unit plasticized with an effective amount of a blend of plasticizers consisting of from 15 to 85 percent by volume of a di(C_5 to C_8 alkyl) adipate and correspondingly from 85 to 15 percent by volume of a C_3 to C_6 alkyl benzyl phthalate.

4,144,218

THERMOSETTING COMPOSITIONS CONTAINING A POLY (ARYLACETYLENE) AND A POLY (PHENYLENE OXIDE)

James E. French, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Jul. 8, 1977, Ser. No. 814,053
Int. Cl.[2] C08K *5/00, 5/17*
U.S. Cl. 260—32.6 R **8 Claims**

1. A thermosetting composition comprising (1) from about 5 to about 30% by weight of a poly(2,6-dialkyl-1,4-phenylene oxide) containing from one to three carbon atoms in the alkyl substituents and (2) from about 70 to about 95% by weight of a polymer composition comprising a prepolymer of at least one polyacetylenically substituted aromatic compound, said compound containing two to three acetylenic groups and one to seven aromatic rings, which rings are selected from the group consisting of the benzene, naphthalene, anthracene and phenanthrene rings and mixtures thereof, and said prepolymer having a number average molecular weight of from about 900 to about 12,000, a ratio of aromatic protons to olefinic protons of from about 2.4:1 to about 30:1 and containing from about 5 to about 20% terminal acetylenic groups by weight of the prepolymer.

4,144,219

POLYURETHANE ADHESIVE COMPOSITION AND USE THEREOF

John F. Malloy, Albany, N.Y., assignor to Norton Company, Worcester, Mass.

Division of Ser. No. 695,381, Jun. 14, 1976, Pat. No. 4,027,435, which is a continuation-in-part of Ser. No. 630,653, Nov. 10, 1975, abandoned, which is a continuation of Ser. No. 369,482, Jun. 13, 1973, abandoned, which is a continuation-in-part of Ser. No. 253,570, May 15, 1972, Pat. No. 3,872,629, which is a continuation-in-part of Ser. No. 34,105, May 4, 1970, abandoned, and Ser. No. 233,572, Mar. 10, 1972, Pat. No. 3,763,604, which is a continuation-in-part of Ser. No. 103,148, Dec. 31, 1970, abandoned, and Ser. No. 822,934, Mar. 8, 1969, abandoned. This application Jan. 3, 1977, Ser. No. 755,959
Int. Cl.[2] C08K *5/02, 5/03;* **C08L** *75/04;* **C09J** *3/16*
U.S. Cl. 260—33.8 UB **11 Claims**

1. An adhesive composition comprising in admixture:
(a) a hydroxy terminated polyurethane-polyester having a hydroxyl number of from about 2 to about 15;
(b) an active hydrogen component containing at least difunctional active hydrogen and having an active hydrogen equivalent weight in the range of from 27 to less than about 500;
(c) a component having available free isocynate groups; and
(d) from about 4.8 to about 30% of a component selected from the group consisting of chlorinated aliphatic hydrocarbon, chlorinated aromatic hydrocarbon, alkylated polystyrene, and mixtures thereof, said component being miscible with components (a), (b) and (c).

4,144,220

HIGH SOLIDS COATING COMPOSITIONS AND PRODUCTION THEREOF

Kazys Sekmakas, Chicago, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

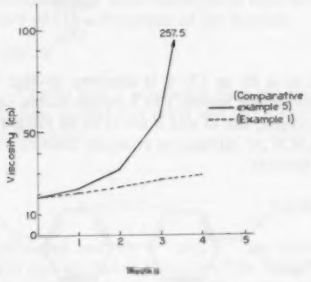
Filed Oct. 29, 1975, Ser. No. 626,865
Int. Cl.[2] C08L *61/28, 61/24*
U.S. Cl. 260—33.2 R **15 Claims**

1. A fluid resinous coating composition essentially free of volatile solvent and which cures on baking to provide high gloss coatings which are strongly adherent to metal substrates, said coating composition consisting essentially of a mixture of:
(1) copolymer of monoethylenic monomers including from 5–20% of monoethylenic monomer having a functional group reactive with the N-methylol group and selected from carboxylic acid, hydroxy, and amide groups, said copolymer being produced by copolymerization in an organic solvent medium consisting essentially of component (2) below;
(2) water insoluble trihydric alcohol which is essentially nonvolatile at curing temperature and which has a molecular weight of from about 500 up to about 5000, said copolymer being dissolved in said trihydric alcohol; and
(3) an aminoplast resin; said copolymer constituting from 4.5% to 30% of the mixture, the water insoluble trihydric alcohol constituting from 30%–60% of the mixture, and the balance of the mixture of the three components consisting essentially of aminoplast resin, there being at least 0.8 parts of aminoplast resin per part of copolymer, sand said copolymer being present in an amount of from 15–80% of the weight of the trihydric alcohol.

4,144,221
CURABLE ORGANOPOLYSILOXANE COATING COMPOSITION CONTAINING BICYCLIC AMIDINE CURING CATALYST

Tadayoshi Ikeda, Amagasaki; Saizo Ikeda, Sakai; Kaname Hashimoto, Himeji, and Masaru Higuchi, Saitama, all of Japan, assignors to Daicel Ltd., Sakai, Japan

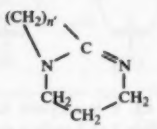
Filed Jan. 30, 1978, Ser. No. 873,230
Claims priority, application Japan, Feb. 21, 1977, 52-17970
Int. Cl.[2] C08G 77/26
U.S. Cl. 260—33.4 SB **11 Claims**



1. A coating solution, consisting essentially of

(a) 100 parts by weight of one or a mixture of hydrolyzed partial condensation products obtained by hydrolyzing and partially condensing one or a mixture of starting compounds having the formula: R_nSiX_{4-n}, wherein n is zero, one or two; R is alkyl having one to four carbon atoms, phenyl, vinyl or allyl; and X is hydroxyl, alkoxy having one to four carbon atoms or chlorine,

(b) from 0.01 to 10 parts by weight of one or a mixture of cyclic amidines having the formula:



wherein N' is five or three, and their salts with a weak acid and (c) one or a mixture of inert organic solvents for components (a) and (b), said inert solvent or solvents being present in an amount sufficient to completely dissolve components (a) and (b).

4,144,222
THERMOSETTING SILICONE RESIN MOLDING COMPOSITION

Hideo Shinmi, Ichihara, and Tsuneo Hanada, Chiba, both of Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Jul. 28, 1977, Ser. No. 820,024
Claims priority, application Japan, Sep. 7. 1976, 51-106239
Int. Cl.[2] C08L 83/04
U.S. Cl. 260—37 SB **8 Claims**

1. A thermosetting silicone resin molding composition consisting essentially of:

(a) 100 parts by weight of an organopolysiloxane resin having the R/Si ratio of 1.0 to 1.7, R being substituted or unsubstituted univalent hydrocarbon radicals bonded to silicon atoms, and containing at least 0.2% by weight of silicon-bonded hydroxyl groups;

(b) organohydrogenpolysiloxane containing at least one silicon-bonded hydrogen atom in each molecule thereof, said organohydrogenpolysiloxane being in such amount that the number of said silicon-bonded hydrogen atoms per silicon-bonded hydroxyl group in said organopolysiloxane of (a) is 0.001 to 0.30;

(c) 0.01 to 15 parts by weight of organotin oxide (wherein the organic radicals are substituted or unsubstituted univalent hydrocarbon radicals); and

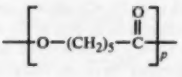
(d) 50–700 parts by weight of at least one inorganic filler.

4,144,223
BLENDS OF TRANS-1,4-POLYMERS AND POLY(EPSILON-CAPROLACTONE)

Eric G. Kent, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada

Filed Oct. 12, 1977, Ser. No. 841,438
Claims priority, application Canada, Oct. 18, 1976, 263579
Int. Cl.[2] C08K 3/36; C08L 9/00
U.S. Cl. 260—42.47 **6 Claims**

1. A blend having improved properties comprising from about 98 to about 50 parts by weight of a trans-1,4 polymer of a C_4–C_5 conjugated diolefinic compound and from about 2 to about 50 parts by weight of a poly(epsilon-caprolactone), said trans-1,4 polymer being selected from a trans-1,4 polymer of butadiene or isoprene in which the trans-1,4 content is at least about 75%, and said poly(epsilon-caprolactone) contains repeat units of the structure



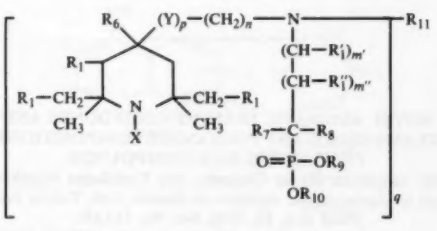
where p is at least 100 but not more than 3,000.

4,144,224
PHOSPHONATE STABILIZERS

Paul Moser, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 17, 1977, Ser. No. 852,273
Claims priority, application Switzerland, Nov. 26, 1976, 14922/76
Int. Cl.[2] C07D 211/44, 211/58; C08K 5/34, 5/53
U.S. Cl. 260—45.75 N **12 Claims**

1. An amino-phosphate of the formula I



$$L_{r'} \cdot A_{r''} \cdot Z_t \cdot (H_2O)_s$$

in which R_1, R'_1 and R''_1 in each case independently of one anothe are hydrogen or C_1–C_4-alkyl, X denotes hydrogen, oxyl, C_1–C_{12}-alkyl, C_3–C_6-alkenyl, C_3–C_4-alkinyl, C_2–C_{21}-alkoxyalkyl, C_7–C_8-aralkyl, 2,3-epoxypropyl, an aliphatic acyl group with 1–4 C atoms or one of the groups $—CH_2COOR_2$, $—CH_2—CH(R_3)—OR_4$, $—COOR_5$ or $—CONHR_5$, in which R_2 is C_1–C_8-alkyl, C_3–C_6-alkenyl, phenyl, C_7–C_8-aralkyl or cyclohexyl and R_3 is hydrogen, methyl or phenyl and R_4 denotes hydrogen, an aliphatic or aromatic, araliphatic or alicyclic acyl group with 1–18 C atoms, in which the aromatic

part can optionally be substituted by chlorine, C_1–C_4-alkyl or C_1–C_8-alkoxy and/or by hydroxyl, and R_5 denotes C_1–C_{12}-alkyl, cyclohexyl, phenyl or benzyl, R_6 is hydrogen, hydroxyl, C_1–C_{12}-alkylamino, cyano or C_2–C_{13}-alkoxycarbonyl, Y is —O— or

P is 0 or 1, if P is 1 n is 2,3 or 4 and, if P is 0, n is 0, 1 or 2, m' and m'' in each case independently of one another are 0 or 1, R_7 is hydrogen, C_1–C_{12}-alkyl, C_2–C_7-alkenyl, cyclohexyl, cyclohexenyl, phenyl, phenyl which is substituted by C_{1-C8}-alkyl, C_1–C_8-alkoxy and/or hydroxyl, or C_7–C_{13}-aralkyl, 2-furyl or 2-pyridyl, R'_1 and R_7 conjointly form branched or unbranched C_2–C_5-alkylene, R_8 is hydrogen or methyl, R_9 is hydrogen, C_1–C_{18}-alkyl or $(M^{+w})w'$, in which M is a cation with a valency of w and in which w' is an integer which is equal to or smaller than w, R_{10} is C_1–c_{18}-alkyl, q is 1 or 2 and, when q is 1, R_{11} is hydrogen, C_1–C_{18}-alkyl, C_2–C_4-alkenyl, C_3–C_{14}-alkoxyalkyl, cyclohexyl, phenyl, phenyl which is substituted by C_1–C_8-alkyl or C_1–C_8-alkoxy, or C_7–C_{13}-aralkyl or C_2–C_{18}-acyl and, when q is 2, R_{11} is C_2–C_6-alkylene or the bisacyl radical of a C_2–C_{10}-dicarboxylic acid, r' and r'' independently of one another have an integral value or are the quotient of two integers between 0 and w, w denoting the valency of the cation mentioned under R_9, with the proviso that $w/w'+r''$ equals $q + r'$ when R_9 is $(M^{+w})/w'$ and that r' and r'' are always 0 when R_9 is hydrogen or alkyl, L is a monovalent anion of a carboxylic acid with 1–24 C atoms or is a hydroxyl ion, A is an alkali metal cation and s has a value of 0 to 2, z denotes an amine of the general formula $R_{12}N(R_{13})R_{14}$, in which R_{12} is C_4–C_{12}-alkyl, C_3–C_{15}-alkoxyalkyl, C_7–C_8-aralkyl, C_5–C_8-cycloalkyl or C_2–C_3-2-hydroxyalkyl and R_{13} and R_{14} independently of one another denote hydrogen, C_1–C_4-alkyl or C_2–C_3-2-hydroxyalkyl, or R_{12} and R_{13}, together with N atom which links them, form a pyrrolidino, morpholino or piperidino radical which is optionally monosubstituted or polysubstituted by methyl, the said piperidino radical optionally carrying amino or C_1–C_{12}-alkylamino in the 4-position, and t is 0, 1 or 2, with the proviso that t is always 0 when R_9 is hydrogen or alkyl.

10. Composition of matter consisting of a polymer and at least one compound of the formula I of claim **1**.

4,144,225

NOVEL AROMATIC DIAMINE COMPOUNDS AND FLAME-RESISTANT POLYAMIDE COMPOSITIONS CONTAINING SAID COMPOUNDS

Keio Yamanaka; Kazuo Okamoto, and Yoshikatsu Mizukami, all of Osaka, Japan, assignors to Kanebo, Ltd., Tokyo, Japan

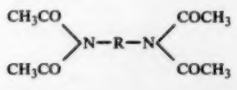
Filed Aug. 12, 1976, Ser. No. 713,651

Claims priority, application Japan, Aug. 18, 1975, 50-100468; Oct. 14, 1975, 50-123947; Apr. 24, 1976, 51-46930

Int. Cl.[2] **C08K** *5/41;* **C07C** *147/13;* **C08K** *5/20;* **C07C** *103/127*

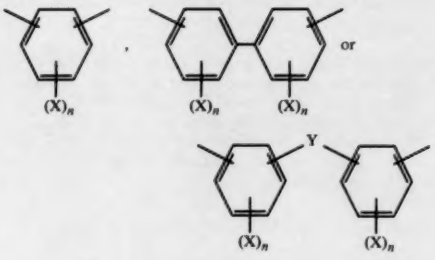
U.S. Cl. 260—45.9 NC **22 Claims**

1. Flame-resistant polyamide composition containing 0.5 to 15% by weight, based on the total amount of the polyamide composition, of N,N,N',N'-tetraacetyl aromatic diamine compound having the formula (1)



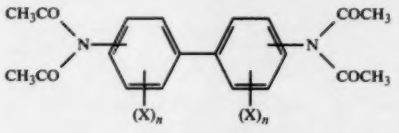
(1),

wherein R is



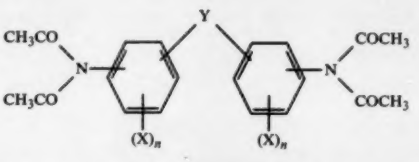
wherein X is Br or Cl; Y is alkylene having 1 to 3 carbon atoms, alkylidene having 1 to 3 carbon atoms, carbonyl, sulfonyl or oxygen; and m and n are O or an integer of 1 to 4.

14. N,N,N',N'-tetraacetyl aromatic diamine compound having the formula



wherein X is Br or Cl and n is an integer of 1 to 4.

17. N,N,N',N'-tetraacetyl aromatic diamine compound having the formula



wherein X is Br or Cl, Y is alkylene having 1 to 3 carbon atoms, alkylidene having 1 to 3 carbon atoms, carbonyl, sulfonyl or oxygen, and n is an integer of 1 to 4.

4,144,226

POLYMERIC ACETAL CARBOXYLATES

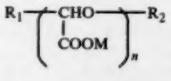
Marvin M. Crutchfield, Creve Coeur; Victor D. Papanu, Maryland Heights, both of Mo., and Craig B. Warren, Rumson, N.J., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 22, 1977, Ser. No. 826,425

Int. Cl.[2] **C08G** *2/14, 2/30;* **C08L** *59/02*

U.S. Cl. 528—231 **23 Claims**

1. An acetal carboxylate polymer having the following general formula:



wherein M is selected from the group consisting of alkali metal, ammonium, alkyl groups having 1 to 4 carbon atoms; tetralkyl ammonium groups and alkanol amine groups having from 1 to 4 carbon atoms in the alkyl chain; n averages at least 4; and R_1 and R_2 are individually any chemically stable group which stabilize the polymer against rapid depolymerization in alkaline solution.

4,144,227
NOVEL COPOLYMERS AND DIAPHRAGMS MADE THEREFROM

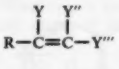
Luigi Giuffre, Milan, Italy; Vittorio de Nora, Nassau, The Bahamas, and Placido Spaziante, Milan, Italy, assignors to Oronzio de Nora Impianti Elettrochimici S.p.A., Milan, Italy

Division of Ser. No. 632,056, Nov. 14, 1975, Pat. No. 4,060,473.
This application Feb. 4, 1977, Ser. No. 765,436
Claims priority, application Italy, Mar. 28, 1975, 21810 A/75
Int. Cl.[2] C08F *8/36, 20/06*
U.S. Cl. 526—40 6 Claims

1. A water-wettable and water-insoluble at least 60% sulfonated copolymer of (A) a monomer of the formula

$$Y—CH=CH—X$$

wherein X is —COOH and Y is selected from the group consisting of hydrogen, methyl and ethyl and (B) a halogenated monomer of the formula



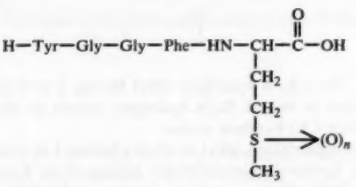
wherein R is halogen and Y', Y'' and Y''' are individually halogen with the proviso that at least one of the Y's is fluorine, and the sulfonic acid group is attached to the carbon atom α to the —COOH group, the ratio of B to A being 1:2.5 to 1:42.

4,144,228
METHIONINE[5]-ENKEPHALIN SULFOXIDES AND SULFONES

David A. Jones, Jr., Evanston, and James M. Schlatter, Glenview, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed May 7, 1976, Ser. No. 684,322
Int. Cl.[2] C07C *103/52;* A61K *37/00*
U.S. Cl. 260—112.5 R 6 Claims

1. A compound of the formula



(I)

wherein n is the integer 1 or 2, and the stereochemical configuration of each of the optically active amino acids is D, L or DL.

4,144,229
PROCESS FOR PREPARING A FLOUR AND THE PRODUCT OBTAINED THEREBY

George B. Karnofsky, Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 611,066, Sep. 8, 1975. This application Nov. 26, 1976, Ser. No. 745,469
Int. Cl.[2] A23J *1/14*
U.S. Cl. 260—123.5 20 Claims

1. A process for extracting oleaginous seed material comprised of non-oil lipids and lipids to prepare a protein flour therefrom which comprises:

(a) countercurrently contacting said seed material with a first concentrated slution of an alcohol in water to extract water, most of said non-oil lipids and some of said lipids;
(b) withdrawing a miscella from step (a);
(c) countercurrently contacting the seed material from step (a) with a second concentrated solution of said alcohol in water to extract substantially all of said lipids;
(d) withdrawing a lipid-rich miscella from step (c);
(e) cooling said lipid-rich miscella to separate a solvent phase and a lipid phase;
(f) retaining al or a large portion of said solvent phase to the process and withdrawing said lipid phase and the remaining small portion, if any, of said slvent phase from the process; and
(g) desolventizing the seed material from step (c) to yield a low-lipid protein flour.

4,144,230
SOLUBLE TRISAZO DYESTUFFS CONTAINING A 2-PHENYL-BENZIMIDAZOLYL, -BENZOXAZOLYL OR -BENZTHIAZOLYL MIDDLE COMPONENT

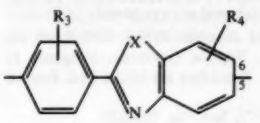
Wolfgang Bauer, Maintal, and Joachim Ribka, Offenbach, both of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed May 10, 1977, Ser. No. 795,434
Claims priority, application Fed. Rep. of Germany, May 19, 1976, 2622303
Int. Cl.[2] C09B *35/36*
U.S. Cl. 260—157 9 Claims

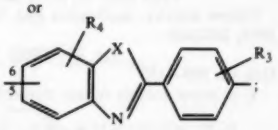
1. A water-soluble trisazo dyestuff of the formula

$$B_1—N=N—Z—N=N—M—N=N—B_2$$

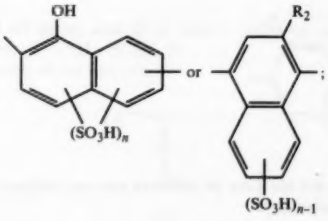
wherein Z is



or



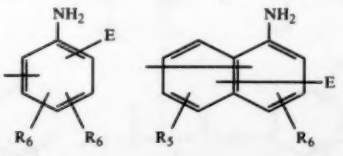
M has the formula



wherein

n is the number 1 or 2,

B_1 and B_2 are the same or different and are selected from the group consisting of



X is

—O— or —S—, R_1 is hydrogen, alkyl having 1 to 4 carbon atoms, phenyl or benzyl;

R_2 is hydrogen, alkyl or alkoxy having 1 to 4 carbon atoms;

R_3 and R_4 are hydrogen, chloro, bromo, alkyl and alkoxy having 1 to 2 carbon atoms;

E is a hydrogen atom, hydroxyl, amino, alkylamino having 1 to 4 carbon atoms, phenylamino, naphthylamino, benzoylamino, naphthoylamino, alkanoylamino having 2 to 5 carbon atoms, carboxyalkylamino having 2 to 3 carbon atoms, sulphoalkylamino having 1 to 2 carbon atoms, hydroxyalkylamino having 1 to 2 carbon atoms, dialkylamino having 1 to 4 carbon atoms in each alkyl, phenylalkylamino, naphthyl-alkylamino having 1 to 4 carbon atoms in the alkyl chains and alkanoyl-alkylamino having 1–4 carbon atoms in the alkyl and 2 to 5 carbon atoms in the alkanoyl group;

R_5 and R_6 are the same or different and are selected from the group consisting of hydrogen, alkyl having 1–4 carbon atoms, alkoxy having 1–4 carbon atoms, nitro, sulpho, chloro, bromo, alkoxy-carbonyl having 2–5 carbon atoms and carboxyl with the proviso that at least one of M, B_1 and B_2 includes a sulpho substituent.

4,144,231

SOLUBLE TRISAZO DYESTUFFS CONTAINING A 2-PHENYL-BENZIMIDAZOLYL, -BENZOXAZOLYL OR -BENZTHIAZOLYL MIDDLE COMPONENT

Wolfgang Bauer, Maintal, and Joachim Ribka, Offenbach am Main-Burgel, both of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 10, 1977, Ser. No. 795,435

Claims priority, application Fed. Rep. of Germany, May 19, 1976, 2622303

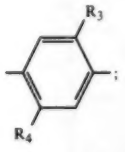
Int. Cl.[2] C09B 35/36

U.S. Cl. 260—157 **13 Claims**

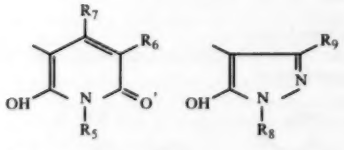
1. A water soluble trisazo dyestuff of the formula

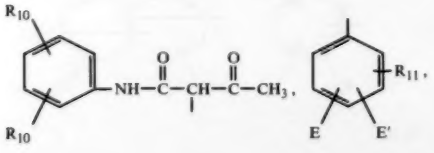
$$B_1\text{-}N{=}N\text{-}Z\text{-}N{=}N\text{-}M\text{-}N{=}N\text{-}B_2$$

wherein M is



B_1 and B_2 are the same or different and are selected from the group consisting of





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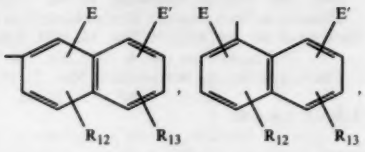
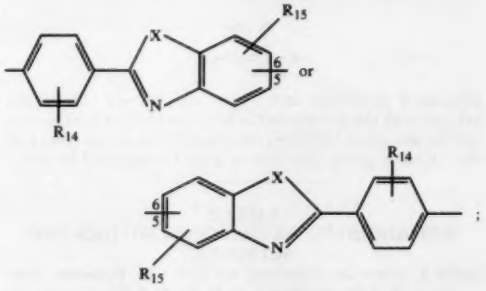


2,4-dihydroxy-3-quinolyl and 2,6-diamino-5-pyridyl;

Z is



X is

—O— or —S—; R_1 is hydrogen, alkyl having 1 to 4 carbon atoms, phenyl or benzyl; R_3 is hydrogen, chloro or alkyl or alkoxy having 1 to 4 carbon atoms;

R_4 is hydrogen chloro, alkyl or alkoxy having 1 to 4 carbon atoms, hydroxy, alkanoylamino having 1 to 4 carbon atoms, benzoylamino, naphthoylamino, oxalylamino, carboxyalkylamino having 2 to 5 carbon atoms, sulphoalkylamino having 1 to 4 carbon atoms or oxyalkylamino having 1 to 4 carbon atoms;

R_5 is hydrogen or alkyl having 1 to 8 carbon atoms; R_6 is —CN, —COOH, —$CONH_2$ or —SO_3H; R_7 is hydrogen or alkyl having 1 to 4 carbon atoms; R_8 is hydrogen, phenyl or phenyl substituted with a methyl, nitro, chloro or sulpho; R_9 is methyl, carboxyl or alkoxycarbonyl having 2 to 5 carbon atoms; R_{10} is hydrogen, methyl, methoxy, chloro, —COOH or —SO_3H;

E is a hydroxyl, amino, alkylamino having 1 to 4 carbon atoms, phenylamino, naphthylamino, benzoylamino, naphthoylamino, alkanoylamino having 2 to 5 carbon atoms, carboxyalkylamino having 2 to 5 carbon atoms, sulphoalkylamino having 1 to 4 carbon atoms, hydroxyalkylamino having 1 to 4 carbon atoms or dialkylamino having 1 to 4 carbon atoms in each alkyl;

E′ is hydrogen or the same or a different member of the group of substituents standing for E,

R_{11}, R_{12} and R_{13} are alkyl or alkoxy having 1 to 4 carbon atoms, carboxyl, sulpho, chloro, bromo, nitro or methoxycarbonyl; R_{14} and R_{15} are hydrogen, methyl, ethyl, methoxy, ethoxy or chloro; with the proviso that at least one of M, B_1 and B_2 includes a sulpho substituent.

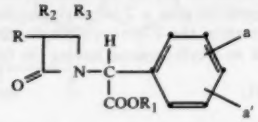
4,144,232

SUBSTITUTED AZETIDIN-2-ONE ANTIBIOTICS

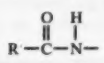
Gary A. Koppel, and Robin D. G. Cooper, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 753,980, Dec. 23, 1976, abandoned. This application Nov. 30, 1977, Ser. No. 855,841
Int. Cl.[2] C07D *205/08;* A61K *31/395;* C07D *277/60*
U.S. Cl. 260—239 A 32 Claims

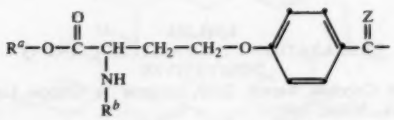
1. A compound of the formula



wherein a and a′ independently are hydrogen, halogen, hydroxy, protected hydroxy, C_1–C_4 alkyl, C_1–C_4 alkoxy, amino, or protected amino, aminomethyl, or protected aminomethyl; R is amino or an acylamino group of the formula



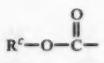
wherein R′ is C_1–C_4 alkyl, cyanomethyl, bromomethyl, chloromethyl, phenyl, or a group of the formula



wherein

R^a is hydrogen, benzyl, diphenylmethyl or 4-methoxybenzyl;

R^b is hydrogen or an amino-protecting group of the formula



wherein R^c is t-butyl, 2,2,2-trichloroethyl, benzyl, 4-nitrobenzyl, cyclopentyl, or cyclohexyl; Z is =O or =N—OZ′, wherein

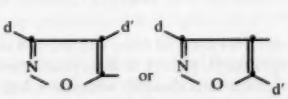
Z′ is hydrogen, acetyl, chloroacetyl, triphenylmethyl or p-methoxybenzyl; or

R′ is a group of the formula

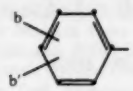
wherein R″ is a phenyl group of the formula

wherein b and b′ independently are hydrogen, halogen, hydroxy, C_1–C_4 alkyl, C_1–C_4 alkoxy, amino or aminomethyl; or

R″ is thienyl, furyl, thiazolyl, oxazolyl, isothiazolyl, tetrazolyl, or an isoxazolyl group of the formula

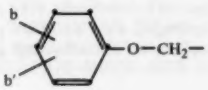


wherein d is hydrogen, methyl, or a group of the formula



wherein b and b′ have the same meanings defined above, and d′ is hydrogen, methyl, or chloro; or

R′ is a phenoxymethyl group of the formula



wherein b and b′ have the same meanings as defined above; or

R′ is a group of the formula

wherein R‴ is a group of the formula

4-pyridyl, thiazolyl, thiadiazolyl, or oxadiazolyl; or

R′ is a group of the formula

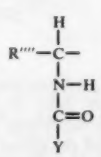
wherein R⁗ is a phenyl group of the formula

thienyl or furyl, and Q is amino, hydroxy, carboxy, $-SO_3H$, or $-NH-SO_3H$; or

R′ is a group of the formula

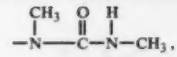
wherein R⁗ has the same meanings as defined above and Z″ is hydrogen, acetyl or methyl; or

R′ is a group of the formula

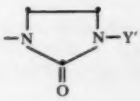


wherein R⁗ is as defined above;

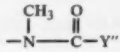
Y is a dimethylureido group of the formula



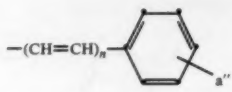
the imidazolidin-2-one group



wherein Y′ is hydrogen, C_1–C_4 alkyl, C_2–C_4 alkanoyl, or methanesulfonyl; or an N-methylacyl group of the formula



wherein Y″ is C_1–C_4 alkyl, or a group of the formula



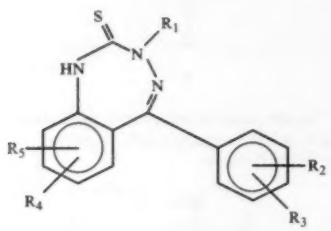
wherein n = 0 or 1 and a″ is hydrogen, nitro, or chloro;
R_1 is hydrogen or a carboxylic acid protecting group;
R_2 is hydrogen, methyl, methylthio, or methoxy;
R_3 is hydrogen or acetoxy, provided that one of R_2 and R_3 is other than hydrogen; and when R_1 is hydrogen the pharmaceutically acceptable non-toxic salts thereof.

4,144,233
METHOD FOR PREPARING BENZO-(1,3,4)-BENZOTRIAZEPINES

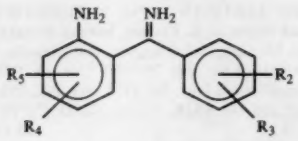
Thomas C. Britton, and Donald L. Trepanier, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 769,125, Feb. 16, 1977, abandoned. This application Jul. 25, 1977, Ser. No. 818,683
Int. Cl.[2] C07D *255/04*
U.S. Cl. 260—239.3 B **1 Claim**

1. A method for preparing a 2H-1,3,4-benzotriazepine-2-thione having the general formula



wherein R_2, R_3, R_4 and R_5 independently represent hydrogen, lower alkyl, lower alkoxy, halo, or loweralkylthio and R_1 represents a lower alkyl or substituted lower alkyl wherein the substituent is selected from the group consisting of hydroxy, amino, monoloweralkylamino, diloweralkylamino, morpholino, piperidino, and pyrollidino which comprises reacting a 2-aminobenzophenone having the formula



wherein R_2, R_3, R_4 and R_5 are the same as already defined, with thiophosgene to give a 2-benzoylphenylisothiocyanate intermediate; treating the 2-benzoylphenylisothiocyanate intermediate with an alkylhydrazine having the formula

$$R_1—NHNH_2$$

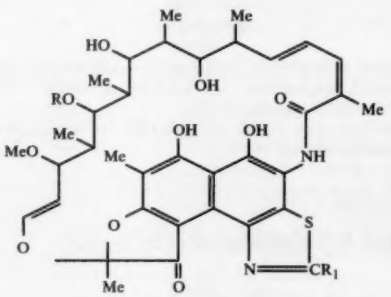
wherein R_1 is as defined above, to give a 2-alkyl-4-(o-benzoylphenyl)thiosemicarbazide; and cyclizing the 2-alkyl-4-(o-benzoylphenyl)thiosemicarbazide with heat in a suitable solvent to form the 2H-1,3,4-benzotriazepine-2-thione.

4,144,234
PREPARATION OF RIFAMYCIN P AND Q DERIVATIVES

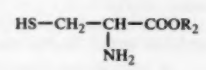
Renato Cricchio, Varese, Italy, assignor to Gruppo Lepetit S.p.A., Milan, Italy

Filed May 12, 1977, Ser. No. 796,290
Claims priority, application United Kingdom, May 28, 1976, 22206/76
Int. Cl.[2] C07D *513/18*
U.S. Cl. 260—239.3 P **10 Claims**

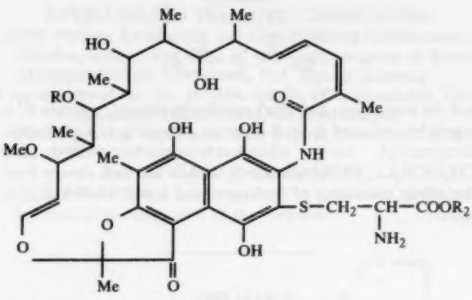
1. A process for preparing a thiazolorifamycin of the formula:



wherein R is hydrogen or CH_3—CO— and R_1 is hydrogen or CH_2OH which comprises reacting rifamycin S or its 25-desacetyl derivative in a water miscible organic solvent at a temperature between room temperature and the boiling point of the reaction mixture with a cysteine ester of the formula:

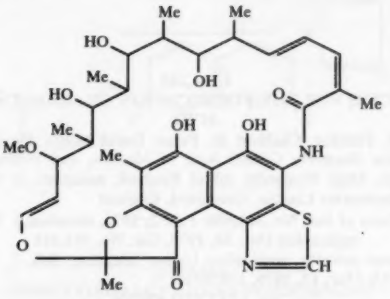


wherein R_2 represents alkyl of from 1 to about 8 carbons, 5 to 8 membered cycloalkyl, phenyl or benzyl and further including the acid addition salts thereof, whereby a 3-(2-substituted ethylthio)-rifamycin SV derivative of the formula:



is obtained, wherein R and R_2 have the same meanings as before, contacting said derivative with an oxidizing agent in an aqueous buffered water-miscible solvent system at a controlled pH value of between 2 and 6.5, submitting the thus obtained thiazolorifamycin carboxyester to decarboxylation by using mild alkaline hydrolysis followed by acidification, or reducing its carboxyester moiety to hydroxymethyl using a suitable reducing agent.

10. The 25-deacetyl rifamycin P of the formula:



4,144,235

THIENO[3,4-b][1,5]BENZOXAZEPIN-10-ONES AND THIENO[3,4-b][1,5]BENZOTHIAZEPIN-10-ONES

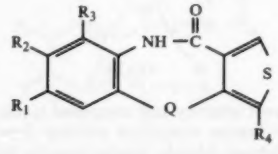
Jeffery B. Press, Bellvale, N.Y., and Sidney R. Safir, River Edge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 13, 1978, Ser. No. 886,234

Int. Cl.[2] **C07D** *513/04, 495/04, 498/04*

U.S. Cl. 260—239.3 T **10 Claims**

1. A compound selected from the group consisting of those of the formula:



wherein Q is divalent oxygen or divalent sulfur; R_1 is selected from the group consisting of hydrogen, lower alkyl and lower alkoxy; R_2 is selected from the group consisting of hydrogen, halogen and lower alkyl, R_3 is selected from the group consisting of hydrogen and lower alkyl; R_4 is selected from the group consisting of hydrogen and halogen.

4,144,236

6-DEOXY-6-AZIDO-14-HYDROXY-7,8-DIHYDROISOMORPHINE OR A PHARMACEUTICALLY ACCEPTABLE SALT THEREOF

Reszö Bognar; Sándor Makleit; Géza Kiss; Sándor Berényi; Terez Mile, all of Debrecen; Jozsef Knoll, Budapest; Sandor Elek, Tiszavasvari; István Gyokér, Tiszavasvari; Attila Zoltai, Tiszavasvari; György Toth, Tiszavasvari, and Laszlo Litkei, Tiszavasvari, all of Hungary, assignors to Alkaloida Vegyeszeti Gyar Tiszavasvari, Tiszavasvari, Hungary

Continuation-in-part of Ser. No. 702,586, Jul. 6, 1976, abandoned, which is a continuation of Ser. No. 502,729, Sep. 3, 1974, abandoned, which is a continuation-in-part of Ser. No. 681,214, Apr. 28, 1976, abandoned. This application May 10, 1977, Ser. No. 795,443

Claims priority, application Hungary, Sep. 4, 1973, AA 750

Int. Cl.[2] **C07D** *489/06;* **A61K** *31/485*

U.S. Cl. 546—46 **1 Claim**

1. 6-Deoxy-6-azido-14-hydroxy-7, 8-dihydroisomorphine or a pharmaceutically acceptable salt thereof.

4,144,237

SYNTHETIC VINBLASTINE AND VINCRISTINE DERIVATIVES

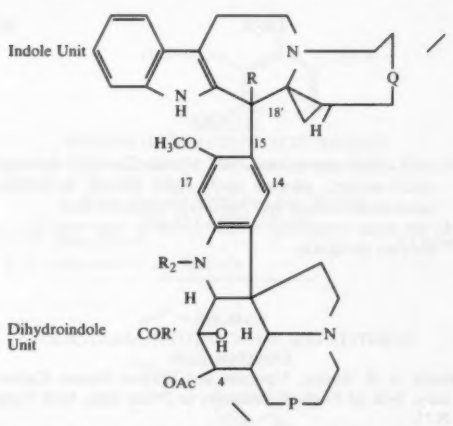
James P. Kutney, Vancouver, Canada, assignor to The United States of America as represented by the Department of Health, Education and Welfare

Continuation-in-part of Ser. No. 582,373, May 30, 1975. This application Jun. 13, 1977, Ser. No. 806,317

Int. Cl.[2] **C07D** *519/04*

U.S. Cl. 260—244.4 **11 Claims**

1. A compound of the formula



wherein Q is a single or double bond at the 3',4'-position of an indole unit, which, with a dihydroindole unit, constitutes the compound; P is a single bond; R is H or COO-alk and alk is alkyl of 1–6 carbon atoms; R_1 is O-alk, NH_2, NH-alk, $N(alk)_2$ or $NHNH_2$ and alkyl is of 1–6 carbon atoms; and R_2 is methyl or formyl.

4,144,238
PROCESS FOR THE PRODUCTION OF PURE WHITE 2-CHLORONICOTINIC ACID

Adel Said, Brig, Switzerland, assignor to Lonza, Ltd., Gampel, Switzerland

Filed Apr. 4, 1977, Ser. No. 784,323

Claims priority, application Switzerland, Apr. 2, 1976, 4124/76

Int. Cl.[2] C07D *213/55*

U.S. Cl. 546—318 **5 Claims**

1. The process for the production of 2-chloronicotinic acid from nicotinic acid-N-oxide, characterized in that the 2-chloronicotinic acid chloride is distilled off from the nicotinic acid-N-oxide reaction mixture and the distillate is allowed to flow into water at a temperature of 40° to 100° C., whereby the 2-chloronicotinic acid chloride is hydrolyzed to the 2-chloronicotinic acid, which precipitates in a pure white crystalline form.

4,144,239
MANUFACTURE OF PYRIDOXIN

Walter Boell, Dannstadt-Schauernheim, and Horst Koenig, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

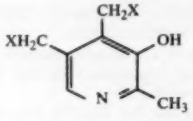
Filed Apr. 14, 1978, Ser. No. 896,165

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1977, 2717478

Int. Cl.[2] C07D *213/67*

U.S. Cl. 546—301 **5 Claims**

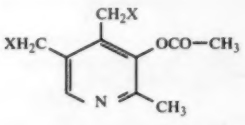
1. A process for the manufacture of pyridoxin from a 2-methyl-3-hydroxy-4,5-bis-(halomethyl)-pyridine of the general formula I



(I)

where X is Cl or Br, wherein

A. the compound of the general formula I is acetylated to form a 2-methyl-3-acetoxy-4,5-bis-(halomethyl)-pyridine of the general formula II



(II)

B. this compound is converted by reaction with an alkali metal acetate, alkaline earth metal acetate or tertiary ammonium acetate into pyridoxin triacetate, and

C. the latter compound is hydrolyzed or trans-esterified to liberate pyridoxin.

4,144,240
SUBSTITUTED MERCAPTOTHIADIAZOLE COMPOUNDS

Charles A. R. Baxter, Margate, and Braham Shroot, Canterbury, both of England, assignors to Pfizer Inc., New York, N.Y.

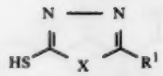
Division of Ser. No. 670,880, Mar. 26, 1976, Pat. No. 4,080,451. This application Sep. 16, 1977, Ser. No. 833,908

Claims priority, application United Kingdom, Mar. 27, 1975, 12813/75; Oct. 2, 1975, 40447/75; Oct. 24, 1975, 43935/75

Int. Cl.[2] C07D *249/12, 271/10, 285/12*

U.S. Cl. 260—302 SD **5 Claims**

1. A heterocyclic thiol of the formula:



and the ammonium and alkali metal salts thereof, wherein R^1 is a member selected from the group consisting of carboxymethoxymethyl, lower alkoxycarbonylmethoxymethyl and $CH_2OCH_2CONR^2R^3$ wherein R^2 and R^3 are each chosen from the group consisting of hydrogen and lower alkyl and X is sulfur.

4,144,241
5-SULFOMETHYL-1,3,4-THIADIAZOLE-2-THIOL

David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 726,378, Sep. 24, 1976, Pat. No. 4,079,134. This application Oct. 27, 1977, Ser. No. 846,042

The portion of the term of this patent subsequent to Jan. 10, 1995, has been disclaimed.

Int. Cl.[2] C07D *285/12*

U.S. Cl. 260—302.5 D **3 Claims**

1. 5-Sulfomethyl-1,3,4-thiadiazole-2-thiol and its alkali metal salts.

4,144,242
PROCESS FOR THE PURIFICATION OF CLAVULANIC ACID

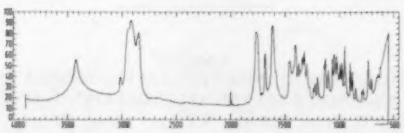
Ian D. Fleming, Chalfont St. Peter; David Noble; Hazel M. Noble (formerly Gillett) both of Marlow, and Wilfred F. Wall, High Wycombe, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Division of Ser. No. 654,638, Feb. 2, 1976, abandoned. This application Dec. 16, 1976, Ser. No. 751,341

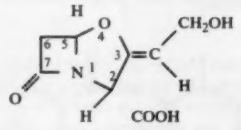
Claims priority, application United Kingdom, Feb. 7, 1975, 5409/75; Mar. 17, 1975, 11076/75

Int. Cl.[2] C07D *498/04*

U.S. Cl. 260—307 FA **11 Claims**



1. A process for the separation of contaminating impurities from a compound selected from the group consisting of clavulanic acid of formula I



I

and a salt thereof whereby said compound is reacted with an aqueous ionic lithium compound selected from the group consisting of lithium chloride, lithium bromide, lithium iodide, lithium sulphate, lithium acetate, lithium propionate, lithium formate, lithium benzoate, lithium lactate and lithium hydroxide in an amount effective to yield an aqueous solution containing lithium clavulanate which is then precipitated therefrom and the precipitate separated from said aqueous solution containing contaminating impurities.

4,144,243
3-PYROZOLYL-4-TRIAZOLYL COMPOUNDS

Alfons Dorlars, Leverkusen, and Carl-Wolfgang Schellhammer, Opladen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

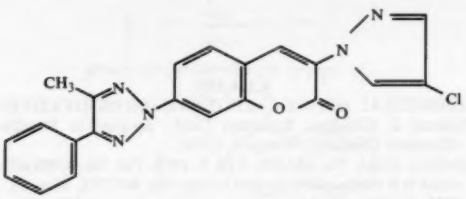
Continuation of Ser. No. 167,859, Jul. 30, 1971, abandoned. This application Feb. 19, 1974, Ser. No. 443,722

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1970, 2037854

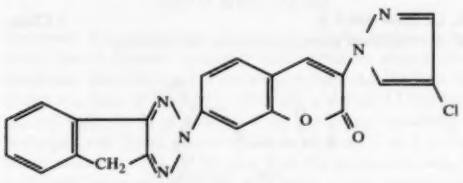
Int. Cl.[2] C07D *405/14;* C09K *1/02*

U.S. Cl. 260—308 A 2 Claims

1. Coumarine compound of the formula



2. Coumarine compound of the formula



4,144,244
PERFLUOROALKYL-IODO NORBORNANE DICARBOXYLIC ACIDS AND DERIVATIVES THEREOF

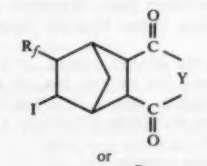
Neal O. Brace, Wheaton, Ill., assignor to Ciba-Geigy Corporation, Ardsley, N.J.

Filed Dec. 27, 1977, Ser. No. 865,060

Int. Cl.[2] C07D *209/76, 307/93;* C07C *61/12*

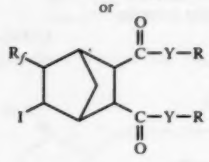
U.S. Cl. 260—326 C 13 Claims

1. A compound having the formula



I

or



II

and an isomeric mixture thereof, wherein

Y is independently oxygen or the group > NR

R is independently hydrogen or alkyl of 1 to 24 carbons or each group - YR is independently a halogen, and

R_f is a straight or branched chain perfluoroalkyl of 1 to 18 carbon atoms or said perfluoroalkyl substituted by a perfluoroalkoxy group of 2 to 6 carbon atoms.

4,144,245
4-HYDROXYMETHYL-2-PYRROLIDINONES

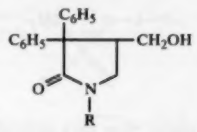
Albert D. Cale, Jr., Mechanicsville, Va., assignor to A. H. Robins Company, Inc., Richmond, Va.

Continuation of Ser. No. 795,847, May 11, 1977, abandoned, which is a continuation-in-part of Ser. No. 615,951, Sep. 23, 1975, Pat. No. 4,119,637. This application Feb. 3, 1978, Ser. No. 892,539

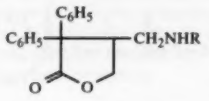
Int. Cl.[2] C07D *207/26, 207/44*

U.S. Cl. 260—326.5 FL 1 Claim

1. A process for the production of a 4-hydroxymethyl-2-pyrrolidinone having the formula



wherein R is selected from the group consisting of hydrogen, lower alkyl having one to six carbon atoms, lower cycloalkyl having four to eight carbon atoms or phenyllower alkyl consisting of benzyl, phenethyl, phenpropyl and α-methylbenzyl which comprises mixing a 4,5-dihydrofuran-2(3H)one of the formula



wherein R is as defined above with a catalytic amount of a strong base to cause intramolecular rearrangement of the 4,5-dihydrofuran-2(3H)one to the 4-hydroxymethyl-2-pyrrolidinone.

4,144,246
PYRROLIDINEACETIC ACID ESTERS

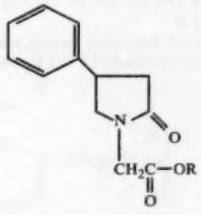
Yvon J. L'Italien, Plymouth, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Filed Nov. 15, 1976, Ser. No. 741,836

Int. Cl.[2] C07D *207/26*

U.S. Cl. 260—326.43 3 Claims

1. A compound of the formula



wherein R is a lower alkyl group having from one to five carbon atoms.

4,144,247

LUBRICATING OIL ADDITIVES

Gerald J. J. Jayne, and Herbert F. Askew, both of Wokingham, England, assignors to Edwin Cooper and Company Limited, Bracknell, England

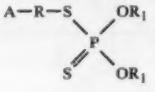
Division of Ser. No. 511,920, Oct. 3, 1974, Pat. No. 4,002,568. This application Sep. 17, 1976, Ser. No. 724,406

Claims priority, application United Kingdom, Oct. 4, 1973, 46372/73

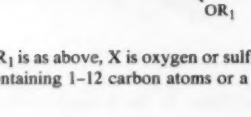
Int. Cl.[2] C07D *333/00, 333/24, 333/16;* C10M *1/48*

U.S. Cl. 260—329 P **6 Claims**

1. A compound having the formula



wherein R is the residue of an intra-molecular sulfur bridged hydrocarbon ring containing 12 carbon atoms, said sulfur bridge forming a thiabicyclo compound containing a 5-membered heterocyclic sulfur-containing ring, each R_1 being independently selected from the group consisting of alkyl, alkenyl, aryl, alkaryl and aralkyl groups and each R_1 containing from 2 to 18 carbon atoms and A is a nucleophilic group selected from the group consisting of —CN, —NCO, —NCS, $-XR_3$,



wherein each R_1 is as above, X is oxygen or sulfur and R_3 is an alkyl group containing 1–12 carbon atoms or a phenyl group.

4,144,248

AROMATIC ACETIC ACID DERIVATIVES HAVING SULFUR ATOM AT ALPHA-POSITION AND PROCESS FOR THEIR PREPARATION

Genichi Tsuchihashi, Tama, and Katsuyuki Ogura, Sagamihara, both of Japan, assignors to Sagami Chemical Research Center, Japan

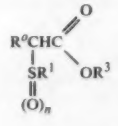
Filed Feb. 28, 1977, Ser. No. 773,114

Claims priority, application Japan, Mar. 4, 1976, 51-22672; Mar. 4, 1976, 51-22673; Dec. 27, 1976, 51-156356

Int. Cl.[2] C07D *333/24, 307/12, 307/16;* A01N *9/00*

U.S. Cl. 260—332.2 A **13 Claims**

1. Novel acetic acid derivative having a sulfur atom at the α-position which are expressed by the formula



(III$_o$)

wherein R^0 represents thienyl or furyl R represents alkyl; R represents hydrogen or alkyl; and n is an integer of 0, 1 or 2.

4,144,249

PREPARATION OF KETONE ACETALS

Silvain A. R. Dewaele, Evergem, Belgium, assignor to s.a. Texaco Belgium n.v., Brussels, Belgium

Division of Ser. No. 689,776, Jun. 25, 1976, Pat. No. 4,092,331. This application Nov. 17, 1977, Ser. No. 852,391

Claims priority, application United Kingdom, Dec. 30, 1975, 53095/75

Int. Cl.[2] C07D *317/44*

U.S. Cl. 260—340.5 R **1 Claim**

1. As a novel compound, 2,2,6,6-tetramethyl-benzobisdioxole.

4,144,250

HERBICIDAL ACTIVE CARBOXANILIDE DERIVATIVES

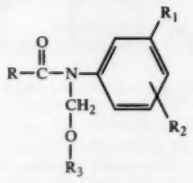
Edmund J. Gaughan, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 655,651, Feb. 6, 1976, Pat. No. 4,088,687, which is a continuation-in-part of Ser. No. 449,782, Mar. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 360,242, May 14, 1973, abandoned. This application Feb. 21, 1978, Ser. No. 879,173

Int. Cl.[2] C07D *317/44*

U.S. Cl. 260—340.5 R **1 Claim**

1. A compound corresponding to the formula:



wherein R is 3,4-methylene-dioxybenzyl, R_1 is chloro, R_2 is 4-chloro and R_3 is ethyl.

4,144,251

5-UNSATURATED PROSTANOIC ACID DERIVATIVES

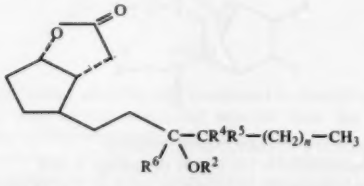
Nedumparambil A. Abraham, Dollard des Ormeaux; Jehan F. Bagli, Kirkland, and Tibor Bogri, Montreal, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Continuation of Ser. No. 663,012, Mar. 2, 1976, abandoned, which is a division of Ser. No. 480,788, Jun. 19, 1974, Pat. No. 3,959,263. This application Dec. 2, 1977, Ser. No. 856,830

Int. Cl.[2] C07D *307/77*

U.S. Cl. 260—343.3 P **3 Claims**

1. A compound of the formula



in which R^2 is hydrogen or a hydroxy protecting radical, R^4, R^5 and R^6 each are hydrogen or lower alkyl and n is an integer from 2 to 5, with the proviso that at least one of R^4, R^5 or R^6 is hydrogen.

4,144,252

WATER-SOLUBLE AMINE-LINKED POLYMERIC COLORANTS

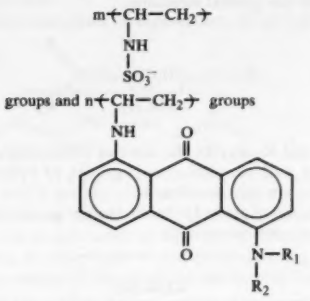
Patricia C. Wang, and Robert E. Wingard, both of Palo Alto, Calif., assignors to Dynapol, Palo Alto, Calif.

Division of Ser. No. 638,730, Dec. 8, 1975, Pat. No. 4,051,138. This application Feb. 7, 1977, Ser. No. 766,298

Int. Cl.[2] C09B *1/16*

U.S. Cl. 260—371 **3 Claims**

1. A water-soluble polymeric coloring composition consisting essentially of



randomly linked together through covalent carbon-carbon bonds into a polymer having a linear aliphatic hydrocarbon backbone, wherein n and m are integers such that the sum of n plus m is a value of from 20 to 3000, and n is from 0.2 to 4 times m; and wherein R_1 is selected from the group consisting of hydrogen and lower saturated alkyls of from 1 to 4 carbon atoms inclusive and R_2 is selected from the group consisting of hydrogen lower saturated alkyls of from 1 to 4 carbon atoms inclusive and aryls or alkaryls of from 6 to 8 carbon atoms inclusive.

4,144,253

9-DEOXY-9-METHYLENE-PGF-TYPE LACTONES

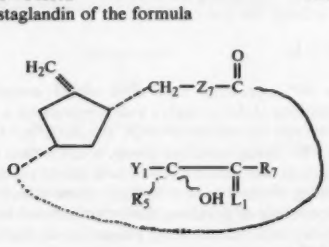
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 682,848, May 4, 1976, Pat. No. 4,060,534, which is a continuation-in-part of Ser. No. 651,622, Jan. 23, 1976, Pat. No. 4,021,467, which is a division of Ser. No. 556,768, Mar. 10, 1975, Pat. No. 3,950,363. This application Sep. 12, 1977, Ser. No. 832,766

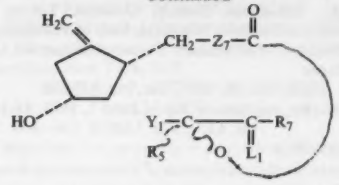
Int. Cl.[2] C07D *313/00*

U.S. Cl. 260—343.41 **211 Claims**

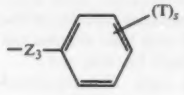
1. A prostaglandin of the formula



-continued



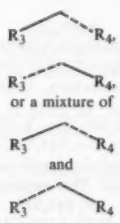
wherein Y_1 is trans—CH=CH—, —C≡C—, or $—CH_2CH_2—$, wherein R_7 is $—(CH_2)_m—CH_3$, wherein m is one to 5, inclusive, or



wherein Z_3 is oxa or methylene and s is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to three carbon atoms, inclusive, with the proviso that not more than two T's are other than alkyl, the various T's being the same or different, and the further proviso that Z_3 is oxa only when R_3 and R_4 are hydrogen or methyl, being the same or different;

wherein R_5 is hydrogen or methyl;

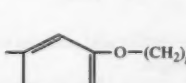
wherein L_1 is



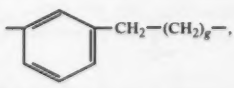
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro, and wherein Z_7 is

(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,
(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,
(6) —CH_2—O—CH_2—$(CH_2)_g$—CH_2—,
(7) —C≡C—CH_2—$(CH_2)_g$—CH_2—,
(8) —CH_2—C≡C—$(CH_2)_g$—CH_2—,

(9)



(10)



wherein g is one, 2, or 3.

4,144,254
PROCESS FOR THE PURIFICATION OF STEROIDS

Haruo Imai, Yokohama; Tadashi Oohama, Tokyo; Ryozo Yamaguchi, and Kunihiro Ninomiya, both of Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Nov. 29, 1977, Ser. No. 855,684
Claims priority, application Japan, Dec. 7, 1976, 51-146833
Int. Cl.[2] C07J *7/00*
U.S. Cl. 260—397.4 22 Claims

1. A process for the purification of 19-norandrost-4-ene-3,17-dione or 19-norethisterone which comprises the steps of:

(a) dissolving crude 19-norandrost-4-ene-3,17-dione or 19-norethisterone in at least one solvent selected from the group consisting of an aromatic hydrocarbon optionally having one or more alkyl side chains and having from 6 to 20 carbon atoms, an alkyl halide having from 1–10 carbon atoms and an alkyl ester of acetic acid having from 3 to 10 carbon atoms;

(b) passing the resulting solution in its entirety through a column packed with basic alumina and collecting the total effluent as a single fraction; and

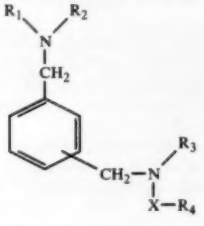
(c) crystallizing pure 19-norandrost-4-ene-3,17-dione or 19-norethisterone from the alumina-treated solution using as the crystallization solvent at least one member selected from the group consisting of an aromatic hydrocarbon optionally having one or more alkyl side chains and having from 6 to 20 carbon atoms, an alkyl halide having from 1 to 10 carbon atoms, a ketone having from 3 to 10 carbon atoms, an alkanol having from 1 to 10 carbon atoms and an alkane having from 5 to 10 carbon atoms.

4,144,255
SUBSTITUTED (PHENYLENEDIMETHYLENE)DIAMINES

Kenneth Richardson, Canterbury, England, assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 720,146, Sep. 3, 1976, Pat. No. 4,058,562, which is a division of Ser. No. 611,856, Sep. 10, 1975, Pat. No. 4,003,929, which is a continuation-in-part of Ser. No. 543,824, Mar. 11, 1975, abandoned. This application Jul. 15, 1977, Ser. No. 815,915
Int. Cl.[2] C09F *5/00*; C11C *3/00*
U.S. Cl. 260—404.5 6 Claims

1. A compound of the structure



and its pharmaceutically acceptable acid addition salts wherein

R_1 and R_2 are both hydrogen,

R_3 and R_4 are each alkyl of from 14 to 20 carbon atoms and X is

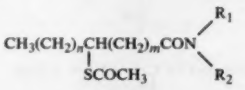
2. A compound of claim 1 wherein R_3 and R_4 are each normal alkyl of from 14 to 20 carbon atoms.

4,144,256
ANTIMICROBIAL FATTY ACID DERIVATIVES

Robert R. Mod, New Orleans; James A. Harris, Pearl River; Jett C. Arthur, Jr.; Frank C. Magne, both of Metairie; Gene Sumrell, New Orleans, and Arthur F. Novak, Baton Rouge, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 744,583, Nov. 23, 1976, Pat. No. 4,062,841.
This application May 10, 1978, Ser. No. 904,644
Int. Cl.[2] C08H *3/00*; A01N *9/20*
U.S. Cl. 260—402.5 9 Claims

1. A sulfur-containing fatty amide having antimicrobial activity and the general structure:



where R_1 and R_2 may be the same or different and are alkyl, alkoxyalkyl, or 3-acetylthiopropyl groups, or hydrogen; n+m = 15 and n=m plus or minus 1.

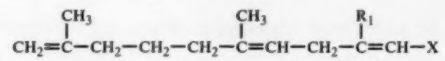
2. The amide of claim 1 wherein the compound is N,N-dibutyl-9(10)-acetylthiostearamide.

4,144,257
PROCESS FOR PREPARING DERIVATIVES OF CONJUGATED DIENE DIMERS

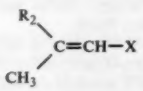
Hidenori Kumobayashi, Chigasaki; Susumu Akutagawa, and Akira Komatsu, both of Tokyo, all of Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 515,754, Oct. 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 404,051, Oct. 5, 1973, abandoned. This application Jul. 30, 1976, Ser. No. 709,982
Int. Cl.[2] C07C *121/30*; C11C *3/00*; C07C *47/20, 49/20*
U.S. Cl. 260—410.9 R 12 Claims

1. A process for preparing derivatives of isoprene dimers having the following formula



Wherein R_1 is a hydrogen atom or a methyl group and X is an aldehyde group, an acetyl group, a carbomethoxy group, or a carboethoxy group, which comprises catalytically reacting in the presence of an inert gas atmosphere and at a temperature of 50° to 150° C. for 2 to 14 hours isoprene with a compound containing an active methyl group and having the general formula



wherein R_2 is a hydrogen atom or a methyl group and X is as defined above, in the presence of 1 to 5 mol% based on the weight of the conjugated diene compound of a nickel complex catalyst having the general formula

wherein Ni^o represents bis-π-allyl nickel complex or bis-cyclooctadiene nickel complex and L represents a ligand consisting of one or more of $P(R'')_3$, $As(R'')_3$, $Sb(R'')_3$, or $P(OR'')_3$, R'' being an alkyl group, a cycloalkyl group or a phenyl group, the molar ratio of said nickel complex to said ligand being about 1:1, in a tertiary amine selected from the group consisting of pyridine, diethylaniline and triethylamine as a solvent, said solvent being present in an amount of about 10 to 200% by volume based on volume of isoprene.

4,144,258
1:1-HETEROCYCLIC AZO METHINE-METAL COMPLEX DYESTUFFS

François L'Eplattenier, Therwil, and Laurent Vuitel, Monthey, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

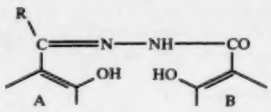
Division of Ser. No. 640,373, Dec. 12, 1975, Pat. No. 4,065,478. This application Oct. 11, 1977, Ser. No. 840,707

Claims priority, application Switzerland, Dec. 17, 1974, 16810/74

Int. Cl.[2] C09B *55/00*

U.S. Cl. 542—418 6 Claims

1. 1:1-Metal complexes of azomethines of the formula I



(I)

wherein A and B are isocyclic or heterocyclic aromatic radicals, and one of the radicals A and B is a heterocyclic ring, R represents a hydrogen atom, an alkyl group containing 1 to 6 carbon atoms, or an aryl radical, and the complexing metal ions are bivalent cations of the transition metals, zinc ions or cadmium ions.

4,144,259
ORGANOPHOSPHORUS NICKEL COMPLEXES AND USE THEREOF

Darryl R. Fahey, and John E. Mahan, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 684,350, May 7, 1976. This application Dec. 8, 1977, Ser. No. 858,768

Int. Cl.[2] C07F *5/04*

U.S. Cl. 260—439 R 7 Claims

1. Tris(triethylphosphine)(triphenylphosphine)nickel(0).

2. A process of preparing tris(triethylphosphine)(triphenylphosphine)nickel(0) comprising reacting suitable amounts of tetrakis(triethylphosphine)nickel(0) and triphenylphosphine in a suitable diluent at suitable reaction conditions under an inert atmosphere.

4,144,260
PRODUCTION OF ALUMINUM SALTS OF N-NITROSO-N-ALKYL-HYDROXYLAMINES

Karl Zoller, Ludwigshafen; Dietmar Werner, Weisenheim, and Eberhard Auer, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

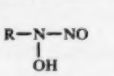
Filed Mar. 28, 1975, Ser. No. 563,225

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1974, 2420874

Int. Cl.[2] C07F *5/06*

U.S. Cl. 260—448 R 10 Claims

1. A process for the production of the aluminum salt of an N-nitroso-N-alkylhydroxylamine of the formula (I):



(I)

in which R is alkyl of 1 to 10 carbon atoms or cycloalkyl of 5 to 7 carbon atoms, by the reaction of an aluminum salt with an alkali metal salt, alkaline earth metal salt and/or ammonium salt of an N-nitroso-N-alkylhydroxyl-amine (I) wherein the reaction and/or the aftertreatment of the aluminum salt of N-nitroso-N-alkylhydroxylamine (I) is carried out in the presence of water, an acid and an organic solvent which is inert under the reaction conditions.

4,144,261
PROCESS FOR PREPARING ORGANOTHIO-ALDOXIME COMPOUNDS

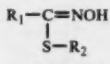
John K. Chan, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sep. 7, 1977, Ser. No. 831,072

Int. Cl.[2] C07C *131/00*

U.S. Cl. 260—453 RW 8 Claims

1. In a process for preparing a compound of the formula:



wherein:

R_1 and R_2 are individually alkyl, cycloalkyl, phenyl or phenylalkyl, all of which may be either unsubstituted or substituted with one or more alkyl, halo, alkoxy, cyano, nitro or dialkylamino substituents, in which an aldoxime of the formula:

$$R_1CH = NOH$$

is reacted with a halogen to form the corresponding 1-haloaldoxime and said 1-haloalkoxime is reacted with the mercaptide salt of a compound of the formula:

$$R_2SM$$

The improvement which comprises conducting the reaction in an aqueous solution containing from about 5 to about 75 percent by weight of a polyhydric alcohol selected from the group consisting of ethylene glycol, glycerol, sorbitol, erythritol or arabitol at a temperature of from about −10° C. to about 15° C.

4,144,262
TRIALLYL CARBONATE MONOMERS

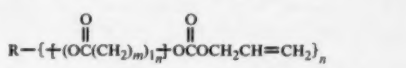
Henry C. Stevens, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 5, 1977, Ser. No. 839,684

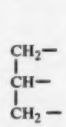
Int. Cl.[2] C07C *69/96*

U.S. Cl. 260—463 2 Claims

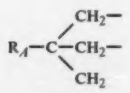
1. An allyl carbonate monomer having the formula:



where the l_n's are integers from 0 to 5, the sum of the l_n's is at least 2, m is 4 or 5, n is greater than 2 and R is chosed from the group consisting of

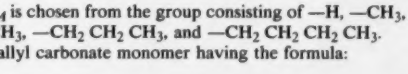


and



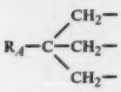
where R_A is chosen from the group consisting of —H, —CH_3, —CH_2 CH_3, —CH_2 CH_2 CH_3, and —CH_2 CH_2 CH_2 CH_3.

2. An allyl carbonate monomer having the formula:



where the 1_n's are integers from 0 to 5, the sum of the 1_n's is at least 2, X is —H or $—CH_3$, n is greater than 2 and R is chosen from the group consisting of

and



where R_A is chosen from the group consisting of —H, $—CH_3$, $—CH_2CH_3$, $—CH_2CH_2CH_3$, and $—CH_2CH_2CH_2CH_3$.

4,144,263

BENZYL CYANOACETALS

David A. Yeowell, Chapel Hill, and Roy A. Swaringen, Jr., Durham, both of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

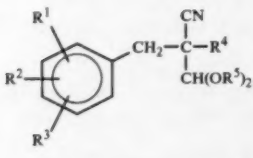
Filed Jun. 8, 1977, Ser. No. 804,537

Claims priority, application United Kingdom, Jun. 9, 1976, 23756/76

Int. Cl.[2] **C07C** *121/75, 121/76, 121/78;* **C07D** *239/48*

U.S. Cl. 260—465 D **14 Claims**

1. A benzyl cyanoacetal of formula (I),



(I)

wherein R^1, R^2 and R^3 are the same or different and each is a halogen or hydrogen atom, an alkoxy group, an alkyl group or a dialkylamino group; R^4 is an alkoxy carbonyl group or an aldehyde group; and R^5 is an alkyl group; the alkyl or alkoxy groups each having from 1 to 4 carbon atoms.

4,144,264

PROCESS FOR PRODUCING A 3-METHYL-2-(4-HALOPHENYL)BUTYRONITRILE

Fujio Masuko, Ibaraki; Kazuhiko Fujiyoshi, Toyonaka; Yoshitaka Ume, Toyonaka; Shinji Nakai, Minoo; Shigeyoshi Kitamura, Toyonaka, and Takeaki Umemura, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 19, 1977, Ser. No. 826,088

Claims priority, application Japan, Aug. 23, 1976, 51-100916

Int. Cl.[2] **C07C** *121/66*

U.S. Cl. 260—465 G **8 Claims**

1. In a process for producing 3-methyl-2-(4-halophenyl)-butyronitrile on a large scale utilizing as starting materials p-halophenylacetonitrile containing a substantial amount of p-halobenzyl alcohol as an impurity therein and an isopropyl halide containing a substantial amount of isopropyl alcohol as an impurity therein, said process comprising reacting said p-halophenylacetonitrile with said isopropyl halide in the presence of a base and a quaternary organoammonium salt as a catalyst, the improvement comprising reducing the p-halobenzyl alcohol content of said p-halophenylacetonitrile to not more than 1% by weight and the isopropyl alcohol content of said isopropyl halide to not more than 1% by weight prior to said reaction.

4,144,265

PROCESS FOR THE MANUFACTURE OF M-TRIFLUOROMETHYL BENZYL NITRILE

William Dowd, and Thomas H. Fisher, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 17, 1978, Ser. No. 925,336

Int. Cl.[2] **C07C** *120/04, 121/66*

U.S. Cl. 260—465 G **7 Claims**

1. A process for the production of m-trifluoromethyl benzyl nitrile comprising chloromethylating trifluoromethyl benzene with chloromethyl methyl ether in the presence of chlorosulfonic acid wherein the molar ratios of chloromethyl methyl ether:chlorosulfonic acid:trifluoromethyl benzene are from 1.2:1.0:0.5 to 2.0:1.0:1.0; quenching the chloromethylation reaction product with water thereby forming an aqueous acid layer and a crude organic chloromethylation product layer; treating the crude organic chloromethylation product layer with an aqueous caustic solution to remove bis-chloromethyl ether impurities; separating the resulting aqueous caustic layer from the crude organic chloromethylation product layer which is essentially free of bis-chloromethyl ether; partially concentrating the ether-free chloromethylation reaction product by removing methanol, water and some of the unreacted trifluoromethyl benzene; and contacting the remaining undistilled chloromethylation reaction product containing m-trifluoromethyl benzyl chloride with aqueous sodium cyanide in the presence of a phase transfer catalyst to form the nitrile.

4,144,266

SULFONATION OF CRUDE OILS TO PRODUCE PETROLEUM SULFONATES

Mark A. Plummer, and Donald E. Schroeder, Jr., both of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Jul. 5, 1973, Ser. No. 376,657

Int. Cl.[2] **C07C** *143/24*

U.S. Cl. 260—505 S **25 Claims**

1. In a process for the preparation of petroleum sulfonates comprising contacting sulfur trioxide with a hydrocarbon selected from the group consisting of whole crude oil, topped crude oil, and mixtures thereof in a reaction zone, at a temperature of from about 80° to about 250° F., at a pressure of from about 0.01 to about 150 atmospheres, and for a reaction time of from about 0.001 to about 3600 seconds wherein from about 5 to about 30 lbs. of sulfur trioxide are contacted with each 100 lbs. of hydrocarbon, the improvement comprising removing unreacted hydrocarbons after said contact with sulfur trioxide and thereafter neutralizing, with base, the produce obtained by said contact with sulfur trioxide, wherein said removal of hydrocarbons comprises the step of extracting the product mixture resulting from said contact of said sulfur trioxide with said hydrocarbon by contacting said product mixture with from about 0.8 to about 2.0 lbs. of an extraction solvent per lb. of said product mixture.

4,144,267

ORGANIC POLYISOCYANATES

Dieter Dieterich, Leverkusen, and Peter Markusch, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 26, 1974, Ser. No. 527,473

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1973, 2359614

Int. Cl.[2] **C07C** *143/24;* **C08G** *63/12;* **C08F** *18/24*

U.S. Cl. 260—505 R **3 Claims**

1. Non-crystalline aromatic polyisocyanates, which contain sulphonic acid or sulphonate groups, prepared by a process comprising reacting at a temperature from −20° C. to 200° C.:

(A) liquid multicomponent aromatic isocyanate mixtures having an NCO content of from 10 to 42% by weight, and having a viscosity of from 8 to 49 cP at 25° C., said liquid multicomponent aromatic isocyanate mixture containing:

(i) at least 40% by weight of phosgenation products of aniline-formaldehyde condensates, and
(ii) at least 20% by weight of 2,6-tolylene diisocyanate, 2,4'-diisocyanato-diphenylmethane, 2,2'-diisocyanato-diphenylmethane or mixtures thereof, said percents by weight being based on the total weight of said liquid multicomponent aromatic isocyanat mixtures, and

(B) from 0.1 to 40% by weight, based on the weight of said liquid multicomponent isocyanate mixture, of sulphur trioxide, or an equivalent quantity of oleum, sulphuric acid, or chlorosulphonic acid.

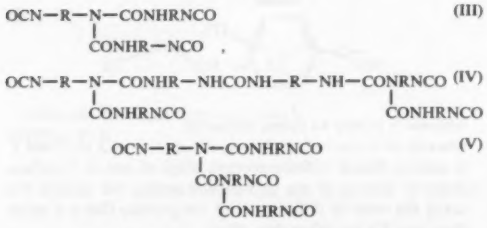
4,144,268

PREPARATION OF BISULPHITE ADDUCTS OF BIRUET-POLYISOCYANATES

Geoffrey B. Guise, Highton, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Feb. 7, 1977, Ser. No. 766,537
Claims priority, application Australia, Feb. 11, 1976, PC4815
Int. Cl.[2] C07C *143/02*
U.S. Cl. 260—513 N **12 Claims**

1. A method for preparing a bisulphite adduct of a biuret-polyisocyanate, said biuret-polyisocyanate being selected from the group consisting of the following members (III), (IV) and (V):



(III)

(IV)

(V)

wherein R in each occurrence is the same or different divalent alkyl, cycloalkyl, aryl or aralkyl radical; which method comprises mixing, within the temperature range of −20° to +30° C., and allowing to react:

(A) one or more biuret-polyisocyanates (III), (IV) and (V) as defined above;
(B) one or more alcohols selected from ethanol, isopropanol, ethylene glycol monomethyl ether, ethylene glycol monoethyl ether, diethylene glycol monoethyl ether and tetrahydrofurfuryl alcohol; and
(C) an aqueous solution containing more than 200 grams per liter at 20° C. of sodium bisulphite;

the proportions of components (A), (B) and (C) being such that the mixture so formed contains more than 20% by weight of non-volatile substances.

4,144,269

PROCESS FOR THE PRODUCTION OF BENZOYL CYANIDE (IV)

Herbert Klenk, Hanau; Theodor Lüssling, Konstanz; Alfred Maierhofer, Allensbach; Heribert Offermanns, Hanau, and Hans Wagner, Konstanz, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Jun. 2, 1977, Ser. No. 802,943
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1977, 2717075
Int. Cl.[2] C07C *51/54, 120/00*
U.S. Cl. 260—545 R **28 Claims**

1. A process for the production of benzoyl cyanide comprising reacting benzoyl chloride and an alkali metal cyanide in a two phase system comprising water and an inert organic solvent which is only slightly miscible with water, said reaction being carried out in the presence of a tertiary amine and hydrogen cyanide, said tertiary amine being an N,N-dialkyl aralkyl amine or an N,N-diaralkyl alkyl amine.

4,144,270

SUBSTITUTED ANILIDES AS ANTI-ANDROGENS

Rudolph O. Neri, Hawthorne, and John G. Topliss, West Caldwell, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 352,804, Apr. 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 146,461, May 24, 1971, abandoned, which is a continuation-in-part of Ser. No. 876,999, Nov. 14, 1969, abandoned, which is a continuation-in-part of Ser. No. 734,854, Jun. 6, 1968, abandoned, which is a continuation-in-part of Ser. No. 537,836, Aug. 22, 1966, abandoned. This application Jun. 26, 1974, Ser. No. 483,260
Int. Cl.[2] C07C *103/34*
U.S. Cl. 260—562 R **5 Claims**

1. A compound selected from the group consisting of 4'-bromo-3'-trifluoromethyl isobutyranilide; 4'-iodo-3'-trifluoromethyl isobutyranilide; 3',4'-dinitro isobutyranilide; N-methyl-4'-nitro-3'-trifluoromethyl isobutyranilide.

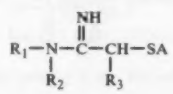
4,144,271

N-SUBSTITUTED MERCAPTOACETAMIDINES AND THEIR USE

Howard Jones, Holmdel, and Conrad P. Dorn, Plainfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 25, 1977, Ser. No. 845,096
Int. Cl.[2] C07C *123/00*
U.S. Cl. 260—564 R **8 Claims**

1. A compound of structural formula:



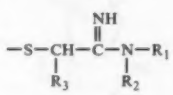
wherein,

R_1 is indanyl; chlorophenyl; bicyclo [3,3,1]nonylmethyl, 1-(p-chlorphenyl)benzyl, 1,2-diphenylethyl; or 2,2-diphenylethyl; and cinnamyl;

R_2 is hydrogen or C_{1-6} alkyl;

R_3 is hydrogen or C_{1-6} alkyl; and

A is hydrogen or



where R_1, R_2 and R_3 are as defined above;
and pharmaceutically acceptable salts thereof.

4,144,272

METHOD OF PREPARING TETRAALKYL THIURAM DISULFIDES

Angelo Bergomi, Akron, and James J. Tazuma, Stow, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 679,527, Apr. 23, 1976, abandoned, which is a continuation of Ser. No. 493,577, Aug. 1, 1974, abandoned, which is a continuation of Ser. No. 301,692, Oct. 27, 1972, abandoned. This application Dec. 14, 1977, Ser. No. 860,494
Int. Cl.[2] C07C *155/10*
U.S. Cl. 260—567 **1 Claim**

1. A method of preparing tetramethyl thiuram disulfide which consists essentially of (A) reacting dimethylamine with carbon disulfide at a temperature in the range of about 30° C.

to about 80° C. in a solution of a solvent of 10–100 weight percent alcohol selected from at least one of methyl alcohol, ethyl alcohol, isopropyl alcohol or t-butyl alcohol, and correspondingly, 90–0 weight percent water, then (B) oxidizing the dithiocarbamate formed by the dimethylamine/carbon disulfide reaction at a temperature in the range of about 0° C. to about 100° C., but not appreciably above the boiling point of the alcohol, substantially immediately after the addition of said dimethylamine, by the addition of hydrogen peroxide while (C) maintaining the acid-base condition of said solution only as the condition generated by the reactants and products themselves; where the mole ratio of the dimethylamine to carbon disulfide is in the range of about 0.8/1 to aboout 1/1 and where the mole ratio of peroxide to dithiocarbamate is in the range of about 0.3/1 to about 0.7/1.

4,144,273

2-DECARBOXY-2-ALKYLCARBONYL-3,7-INTER-M-PHENYLENE-3-OXA-4,5,6-TRINOR-11-DEOXY-PGF$_1$ COMPOUNDS

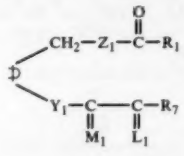
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 888,695, Mar. 21, 1978, Pat. No. 4,123,463. This application Jul. 17, 1978, Ser. No. 925,263

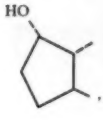
Int. Cl.^{2} C07C *177/00*

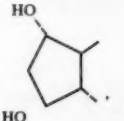
U.S. Cl. 260—590 C **33 Claims**

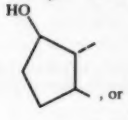
1. A prostaglandin analog of the formula

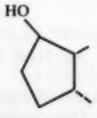


wherein $\mathfrak{D}$ is

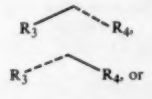




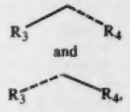




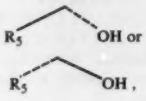
wherein R_1 is alkyl of one to 4 carbon atoms, inclusive;
wherein L_1 is



a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein M_1 is



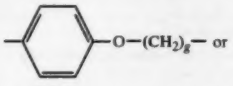
wherein R_5 is hydrogen or methyl;
wherein R_7 is
(1) $-(CH_2)_m-CH_3$,

(2)

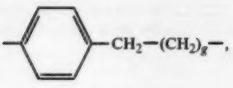
(3)

wherein h is zero to three, inclusive,
wherein m is one to 5, inclusive, s is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms or alkoxy of one to 3 carbon atoms, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;
wherein Y_1 is
(1) trans—CH=CH—
(2) cis—CH=CH—
(3) $-CH_2CH_2-$, or
(4) $-C\equiv C-$; and
wherein Z_1 is

(1)



(2)



wherein g is one, two or three.

4,144,274

2-DECARBOXY-2-ALKYLCARBONYL-11-DEOXY-PGE COMPOUNDS

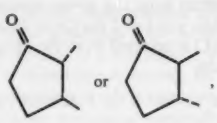
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 888,695, Mar. 21, 1978, Pat. No. 4,123,463. This application Jul. 17, 1978, Ser. No. 925,264

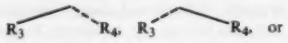
Int. Cl.^{2} C07C *177/00*

U.S. Cl. 260—590 C **47 Claims**

1. A prostaglandin analog of the formula
where $\mathfrak{D}$ is

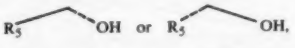


wherein R_1 is alkyl of one to 4 carbon atoms, inclusive;
wherein L_1 is



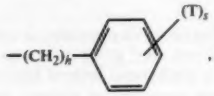
or a mixture of

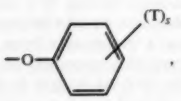
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein M_1 is



wherein R_5 is hydrogen or methyl;
wherein R_7 is

$$-(CH_2)_m-CH_3, \quad (1)$$


(2)


(3)

wherein h is zero to three, inclusive,
wherein m is one to 5, inclusive, s is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, or alkoxy of one to 3 carbon atoms, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;
wherein Y_1 is
(1) trans-CH=CH—
(2) cis-CH=CH—
(3) $-CH_2CH_2-$, or
(4) —C≡C—; and
wherein Z_1 is
(1) cis-CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis-CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis-CH_2—CH=CH—$(CH_2)_g$—CH_2—,
(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,
(6) —CH_2—O—CH_2—$(CH_2)_g$—CH_2—,
(7) —$(CH_2)_2$—O—)$CH_2)_g$—CH_2—,
(8) —$(CH_2)_3$—O—$(CH_2)_g$—,
(9) —C≡C—CH_2—$(CH_2)_g$—CH_2—,
(10) —CH_2—C≡C—$(CH_2)_g$—CH_2—, or
(11) trans-$(CH_2)_2$—$(CH_2)_g$—CH=CH—,
wherein g is one, two, or three.

4,144,275

Patent Not Issued For This Number

4,144,276

3,7-INTER-PHENYLENE-4,5,6-TRINOR-3-OXA-2-DECARBOXY-2-HYDROXYMETHYL-9-DEOXY-9-METHYLENE-PGF-TYPE COMPOUNDS

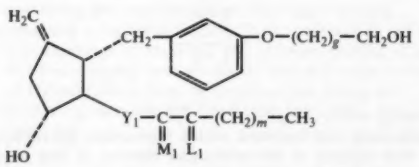
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 832,239, Sep. 12, 1977, which is a division of Ser. No. 682,848, May 4, 1976, Pat. No. 4,060,534, which is a continuation-in-part of Ser. No. 651,622, Jan. 23, 1976, Pat. No. 4,021,467, which is a division of Ser. No. 556,768, Mar. 10, 1975, Pat. No. 3,950,363. This application May 8, 1978, Ser. No. 904,189

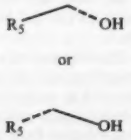
Int. Cl.[2] C07C *177/00*

U.S. Cl. 568—645 **1 Claim**

1. A prostaglandin analog of the formula

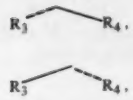


wherein Y_1 is trans—CH=CH—, —C≡C—, or $-CH_2C-H_2-$;
wherein M_1 is

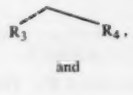


wherein R_5 is hydrogen or methyl;
wherein L_1 is

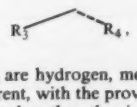
-continued



or a mixture of



and



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein g is one, 2, or 3; and
wherein m is one to 5, inclusive.

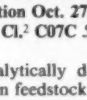
4,144,277

DEHYDROGENATION OF HYDROCARBONS WITH ZINC TITANATE CATALYST

Darrell W. Walker, and Floyd E. Farha, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 743,196, Nov. 19, 1976, abandoned. This application Oct. 27, 1977, Ser. No. 844,932
Int. Cl.[2] C07C *5/36*
U.S. Cl. 260—666 A **16 Claims**

1. A process for catalytically dehydrogenating a dehydrogenatable hydrocarbon feedstock having at least one



grouping which comprises:
contacting said feedstock with a regenerable dehydrogenation catalyst in the substantial absence of free oxygen under dehydrogenation conditions wherein said regenerable dehydrogenation catalyst is prepared by calcining a mixture of zinc oxide and titanium dioxide at a temperature in the range of from about 650° to about 1050° C.

4,144,278

DIOLEFIN DIMERIZATION USING NITROSYL HALIDES OF IRON TRIAD METALS

Daniel J. Strope, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 20, 1977, Ser. No. 817,471
Int. Cl.[2] C07C *3/02*
U.S. Cl. 260—666 B **27 Claims**

1. A process for the dimerization of at least one conjugated diolefin comprising contacting said at least one diolefin under dimerization conditions with a catalytic amount of a catalyst formed on admixing components consisting essentially of (1) at least one elemental metal selected from the group consisting of manganese, tin, and zinc with (2) at least one nitrosyl metal halide selected from the group consisting of nitrosyl metal halides having the formulas $[Fe(NO)_2X]_y$, $[Co(NO)_2X]_y$, $[Ni(NO)X]_y$, $Fe(NO)_2(L)X$, $Ni(NO)(L)X$, and $Co(NO)_2(L)X$, wherein X is selected from the group consisting of chloride, bromide, and iodide, y is 1 or 2 for Co or Fe and 1,2,3 or 4 for Ni, and wherein (L) is selected from the group of compounds having the formulas

R_3M, $(RO)_3M$, SR', $R{-}S{-}R$, R_3MO, OR', and $R{-}O{-}R$

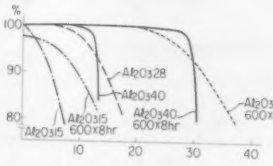
wherein each R is individually selected from the group consisting of hydrocarbyl aromatic radicals, hydrocarbyl aliphatic radicals, halo-substituted hydrocarbyl aromatic radicals, halo-substituted aliphatic hydrocarbyl radicals, alkoxy-substituted hydrocarbyl aromatic radicals and alkoxy-substituted aliphatic hydrocarbyl radicals having up to about 20 carbon atoms, wherein R′ is a divalent saturated or olefinically unsaturated hydrocarbyl radical having 3 to 7 carbon atoms, and wherein M is phosphorus, antimony, or arsenic.

4,144,279

ARALKYLATION OF ALKYLBENZENES

Atsushi Sato; Isoo Shimizu, both of Yokohama, and Eiichi Matsuzaka, Tokyo, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Tokyo, Japan

Filed Apr. 20, 1978, Ser. No. 898,328
Claims priority, application Japan, Apr. 27, 1977, 52-47778
Int. Cl.[2] C07C *3/10*
U.S. Cl. 260—668 R **3 Claims**



1. In the reaction wherein an alkylbenzene or alkylbenzenes containing in the substituent alkyl group or groups from 1 to 4 carbon atoms in total is aralkylated with at least one styrene selected from the group consisting of styrene, vinyltoluenes and α-methylstyrene a process which comprises carrying out the reaction by continuously feeding to a catalyst layer the above-mentioned alkylbenzene or alkylbenzenes and styrene sources in liquid phase at a temperature from 100° C. to 200° C., said catalyst layer consisting essentially of synthetic silica-alumina containing from 20% by weight to 50% by weight alumina that has been calcined at a temperature in the range from 450° C. to 600° C.

4,144,280

VAPOR CIRCULATION IN HYDROCARBON CONVERSION PROCESSES

George R. Winter, III, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 801,984, May 31, 1977, Pat. No. 4,079,093. This application Jan. 19, 1978, Ser. No. 870,967
The portion of the term of this patent subsequent to Mar. 14, 1995, has been disclaimed.
Int. Cl.[2] C07C *3/52, 3/62*
U.S. Cl. 260—671 R **5 Claims**

1. A hydrocarbon conversion process which comprises the steps of:
(a) reacting hydrocarbons of said hydrocarbon conversion process in a reaction zone to form a mixed-phase reaction zone effluent stream comprising a hydrocarbon having six or more carbon atoms per molecule and at least one volatile chemical consisting essentially of a catalyst promoter selected from the group consisting of boron trifluoride,

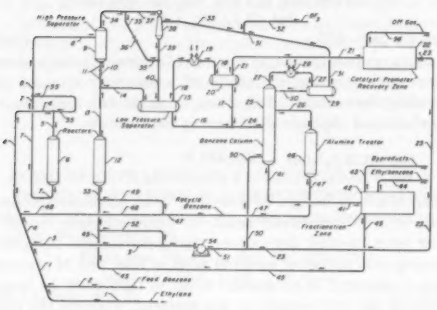
carbon tetrachloride, hydrogen fluoride, and hydrogen bromide;

(b) passing said mixed-phase reaction zone effluent into a first vapor-liquid separation zone to therein separate said mixed-phase effluent to a first liquid hydrocarbon stream comprising a hydrocarbon having six or more carbon atoms per molecule and a first vapor stream comprising a catalyst promoter consisting essentially of at least one volatile chemical selected from the group consisting of boron trifluoride, carbon tetrachloride, hydrogen fluoride, and hydrogen bromide;

(c) passing at least a portion of said first vapor stream through an ejector as a motive stream utilized to pump a second vapor stream comprising catalyst promotor consisting essentially of at least one volatile chemical selected from the group consisting of boron trifluoride, carbon tetrachloride, hydrogen fluoride, and hydrogen bromide to form an ejector effluent vapor stream;

(d) passing said ejector effluent vapor stream into a second vapor-liquid separation zone having a lower pressure than said first vapor-liquid separation zone;

(e) passing said first liquid hydrocarbon stream into said second vapor-liquid separation zone;



(f) passing a second liquid hydrocarbon stream comprising said hydrocarbon having six or more carbon atoms per molecule from said second vapor-liquid separation zone to a fractionation zone having a lower pressure than said second vapor-liquid separation zone;

(g) withdrawing from said fractionation zone a net overhead vapor stream comprising the catalyst promotor consisting essentially of a volatile chemical selected from the group consisting of boron trifluoride, carbon tetrachloride, hydrogen fluoride, and hydrogen bromide, and passing said net overhead vapor steam into said ejector as the second vapor stream;

(h) withdrawing from said second vapor-liquid separation zone a third vapor stream comprising the catalyst promotor consisting essentially of a volatile chemical selected from the group consisting of boron trifluoride, carbon tetrachloride, hydrogen fluoride, and hydrogen bromide, and passing said third vapor stream into a vapor purification zone to effect removal of an impurity from said third vapor stream to produce a fourth vapor stream having a higher concentration of said volatile chemical than possessed by said third vapor stream; and

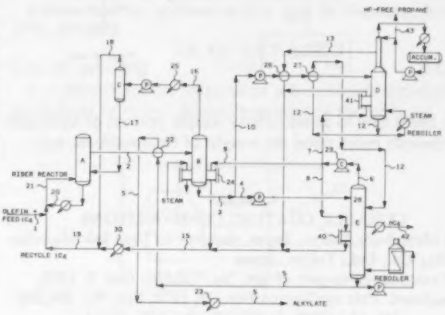
(i) withdrawing a fractionation product stream comprising said hydrocarbon having six or more carbon atoms per molecule from said fractionation zone.

4,144,281

HF ALKYLATION PROCESS UTILIZING COMPRESSED ISOPARAFFIN VAPOR IN INDIRECT HEAT EXCHANGES

Charles C. Chapman, and Paul D. Hann, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 27, 1978, Ser. No. 900,554
Int. Cl.[2] C07C *3/54*
U.S. Cl. 260—683.48 **8 Claims**



1. An alkylation process which comprises the steps of:

contacting an olefin and isoparaffin with an HF acid catalyst under alkylation conditions to form an alkylation reaction effluent comprising alkylate, isoparaffin, HF acid, and non-reacted paraffins,

passing said reaction effluent to a phase separation zone and allowing said effluent to separate into a hydrocarbon phase and an acid phase,

passing said hydrocarbon phase to an HF acid stripping zone and therein subjecting said hydrocarbon phase to such stripping conditions as to remove overhead an HF acid phase and as bottoms a hydrocarbon phase substantially free of HF,

passing said bottoms hydrocarbon phase removed from said HF acid stripping zone to an isoparaffin stripping zone and removing overhead therefrom an isoparaffin vapor stream substantially free of HF,

compressing said overhead isoparaffin vapor stream,

passing said compressed isoparaffin vapor stream in indirect heat exchange relationship with a lower portion of said HF acid stripping zone as a source of heat for said removal of HF acid phase from the hydrocarbon phase, and

withdrawing said alkylate from said isoparaffin stripping zone.

4,144,282

OCTANE UPGRADING OF LIGHT NAPHTHA STREAMS USING A FLUOROSULFONIC ACID, HYDROFLUORIC ACID AND ANTIMONY PENTAFLUORIDE CATALYST

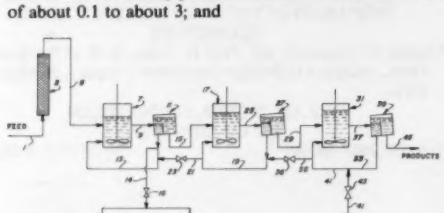
David A. McCaulay, Homewood, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 385,596, Aug. 3, 1973, abandoned. This application Apr. 25, 1975, Ser. No. 571,737
Int. Cl.[2] C07C *5/28;* B01J *27/12*
U.S. Cl. 260—683.68 **14 Claims**

1. A catalyst composition comprising fluorosulfonic acid and antimony pentafluoride in a volume ratio of antimony pentafluoride to fluorosulfonic acid of about 0.1 to about 3 and about two to about twenty weight percent of hydrogen fluoride based upon the weight of fluorosulfonic acid.

7. A process for upgrading the octane rating of pentanes, hexanes or mixtures thereof which comprises contacting under isomerizing conditions said pentanes, hexanes or mixtures thereof, an inhibitor to prevent runaway cracking and a composition comprising:

(1) fluorosulfonic acid and antimony pentafluoride in a volume ratio of antimony pentafluoride to fluorosulfonic acid of about 0.1 to about 3; and



(2) about two to about twenty weight percent of hydrogen fluoride based upon the weight of fluorosulfonic acid.

4,144,283

CURABLE COATING COMPOSITIONS

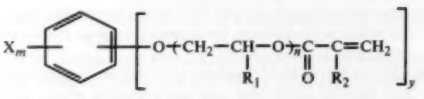
Toru Matsubara, Tokyo, Japan, assignor to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 730,500, Oct. 7, 1976, abandoned. This application Feb. 27, 1978, Ser. No. 881,280

Int. Cl.[2] C08L *63/00, 27/00;* **C07C** *69/54*

U.S. Cl. 260—836 **5 Claims**

1. A curable coating composition for paints, varnishes and printing inks comprising a (meth)acrylic acid ester represented by the following general formula



wherein X is selected from the group consisting of methyl and methoxy groups and chlorine atom, R_1 and R_2 are each a hydrogen atom or methyl group, m is zero or 1, y is an integer of 2 to 4, and n is an integer of 1 to 10.

4,144,284

SHAPED ARTICLES OF SYNTHETIC POLYMERS

Daniel Semanaz, Vernaison, and Jany Mourlan, Lyon, both of France, assignors to Rhone-Poulenc Industries, Paris, France

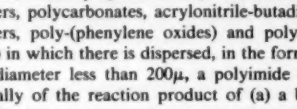
Filed Mar. 3, 1976, Ser. No. 663,358

Claims priority, application France, Mar. 21, 1975, 75 08919

Int. Cl.[2] C08L *77/00*

U.S. Cl. 260—857 PA **4 Claims**

1. A moulded article consisting essentially of a matrix of thermoplastic polymer selected from olefine and fluoroolefine polymers, linear polyesters, vinyl ester and vinyl chloride polymers, polycarbonates, acrylonitrile-butadiene-styrene copolymers, poly-(phenylene oxides) and poly(phenylene sulphides) in which there is dispersed, in the form of particles of mean diameter less than 200μ, a polyimide resin consisting essentially of the reaction product of (a) a bis-imide of the formula:

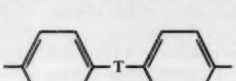


(I)

and (b) a diamine of the formula:

$$NH_2 - B - NH_2 \qquad \text{(II)}$$

in which formulae the symbol Y represents H, CH_3 or Cl, and the symbols A and B, which may be identical or different, represent a phenylene or cyclohexylene radical or a radical



wherein T represents $-CH_2-$, $-C(CH_3)_2-$, $-O-$, $-SO_2-$ or $-S-$, the bis-imide/diamine molar ratio being greater than 1, including a polyimide resin modified by using, in addition to the bis-imide (I) and the diamine (II): a monomide; a primary monoamine; a secondary monoamine; a polyamine; a monomer, other than a maleimide, containing polymerizable $CH_2 = C <$ groups or an unsaturated polyester; and the amount of polyimide resin constituting from 30 to 75% of the weight of the mixture of matrix + polyimide resin.

4,144,285

PROCESS FOR PRODUCING HYDROLYSIS-STABLE SHAPED STRUCTURES OF POLYESTER

Max Maschek, Domat-Ems, GR, CH; Marcel Capaul, and Wolfgang Griehl, both of Chur, GR, CH, all of Switzerland, assignors to Inventa AG Fur Forschung und Patent-verwertung, Zurich, Zurich, Switzerland

Filed Jun. 6, 1977, Ser. No. 804,140

Int. Cl.[2] C08L *67/06*

U.S. Cl. 260—873 **13 Claims**

1. In a process for the production of hydrolysis-stable shaped structures consisting essentially of a polyester material produced by the reaction of dicarboxylic acids with substituted or unsubstituted aliphatic diols having the formula

$$HO-(CH_2)_n-OH$$

wherein n is an integer of from 2 to 10 or polyesters prepared from hydroxycarboxylic acids, or polymethylene oxides or their ester forming derivatives, the improvement comprising treating said polyester material with at least one N-glycidylimide compound in an amount equal to 0.05–6.0% by weight based on the total weight of said material, whereby the terminal carboxyl group content is reduced.

4,144,286

THERMOPLASTIC PVC RESIN COMPOSITIONS

Rudolf Casper; Wilfried Nolte, both of Leverkusen, and Hans Braese, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 22, 1977, Ser. No. 780,128

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1976, 2613121

Int. Cl.[2] C08L *51/00, 53/00*

U.S. Cl. 260—876 R **2 Claims**

1. A thermoplastic moulding composition comprising 20 to 90% by weight of polyvinyl chloride and 10 to 80% by weight of a mixture of

(1) 40 to 70% by weight of a thermoplastic resin which is a copolymer of 30 to 40 parts by weight of α-methyl styrene, 52 to 62 parts by weight of methyl methacrylate and 4 to 14 parts by weight of acrylonitrile, and

(2) 30 to 60% by weight of a graft polymer of 40 to 60 parts by weight of monomer mixture of 40 to 60 parts by weight of styrene, 0 to 10 parts by weight of acrylonitrile and 40 to 50 parts by weight of methyl methacrylate grafted on 40 to 60 parts by weight of polybutadiene or a butadiene/-sytrene copolymer containing up to 30% by weight of copolymerized styrene.

4,144,287

IMPACT-RESISTANT RESIN COMPOSITION

Teizo Kudo; Shoji Furukawa, and Keizi Kubo, all of Sakai, Japan, assignors to Daicel Ltd., Sakai, Japan

Filed Oct. 28, 1977, Ser. No. 846,352
Claims priority, application Japan, Oct. 29, 1976, 51-130934
Int. Cl.[2] C08L *53/02*
U.S. Cl. 260—876 R 11 Claims

1. An impact-resistant resin composition which consists essentially of a blend of:

1. 100 parts by weight of a mixture of graft copolymers consisting of;

50 to 90% by weight of a graft copolymer (A) obtained by polymerizing a monovinyl aromatic hydrocarbon monomer and an ethylenically unsaturated nitrile monomer, in the presence of a diene rubber component, first under bulk polymerization conditions and subsequently continuing the polymerization under suspension polymerization conditions until the polymerization is substantially completed, the number average particle size of said rubber component of said graft copolymer (A) being in the range of from 0.2 to 0.7 microns, and 10 to 50% by weight of a graft copolymer (B) obtained by polymerizing a monovinyl aromatic hydrocarbon monomer, with a monomer selected from the group consisting of an ethylenically unsaturated nitrile monomer, an alkyl ester monomer of acrylic acid or methacrylic acid and mixture thereof in the presence of a diene rubber latex, under emulsion polymerization conditions; and

2. 3 to 30 parts by weight, per 100 parts by weight of said mixture of said graft copolymers, of a chlorinated polymer having a degree of chlorination of from 25 to 45% by weight and selected from the group consisting of chlorinated polyethylene, chlorinated ethylene-propylene copolymer and chlorinated ethylene-butene copolymer.

4,144,288

SODIUM TETRABORATE PENTAHYDRATE AS A SMOKE SUPPRESSANT FOR STYRENIC RESINS

Jeffrey D. Miano, Norristown, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 20, 1978, Ser. No. 870,971
Int. Cl.[2] C08K *3/38, 5/06, 5/09*
U.S. Cl. 260—880 R 9 Claims

1. A flame retarded and smoke suppressed composition consisting essentially of 100 parts of a styrenic resin selected from the group consisting of polystyrene, poly(chlorostyrene), poly(bromostyrene), poly(α-methyl styrene), poly(vinyltoluene), poly(vinylnaphthalene), acrylonitrile-butadiene-styrene terpolymer, styrene-acrylonitrile copolymer, high, low and medium impact polystyrenes, and mixtures thereof admixed with about 1 to 50 parts of a brominated aromatic flame retardant and about 10 to 50 parts of sodium tetraborate pentahydrate.

4,144,289

VINYLIDENE CHLORIDE RESIN COMPOSITIONS CONTAINING CHLORINATED ETHYLENE/ACRYLATE OR METHACRYLATE COPOLYMER

Takeshi Watanabe, and Kenichiro Kodama, both of Nobeoka, Japan, assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 19, 1978, Ser. No. 916,668
Int. Cl.[2] C08L *27/08*
U.S. Cl. 260—897 C 5 Claims

1. A molding grade vinylidene chloride resin composition comprising (a) 100 parts by weight of a vinylidene chloride resin obtained by polymerizing from 60 to 95 parts by weight of monomeric vinylidene chloride and from 40 to 5 parts by weight of an ethylenically unsaturated comonomer and (b) from 3 to 60 parts by weight of a chlorinated copolymer of from 50 to 95 parts by weight ethylene and from 5 to 50 parts by weight of an acrylic or methacrylic acid ester containing from 1 to 18 carbon atoms in the ester group, said copolymer having a chlorine content of from 5 to 50 percent by weight.

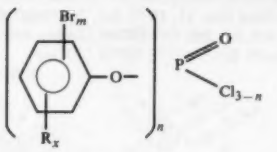
4,144,290

PRODUCTION OF BROMOARYL CHLOROPHOSPHATES

Karl-Heinz Mitschke, Odenthal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 3, 1977, Ser. No. 848,413
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1976, 2653095
Int. Cl.[2] C07F *9/14*
U.S. Cl. 260—986 4 Claims

1. A process for the preparation of brominated aryl dichlorophosphates or diaryl chlorophosphates of the formula:



wherein

R each independently is hydrogen, an alkoxy radical or alkyl radical containing 1 to 10 C-atoms, a perfluoroalkyl radical containing 1 to 10 C-atoms halogen, the group $-NO_2$, $-SO_3H$, $Cl_2P(O)O-$ or $CL_2P(O)OC_6H_4-CR'_2-$,

R^1 each independently is hydrogen or an alkyl radical containing 1 to 4 C-atoms,

x is an integer from 1 to 4,

n is 1 or 2, and

m is from 0.1 to 2,

comprising reacting the corresponding aryl dichlorophosphates or diaryl chlorophosphates with a substantially equimolar mixture of bromine and chlorine at a temperature between about −10 and 100° C.

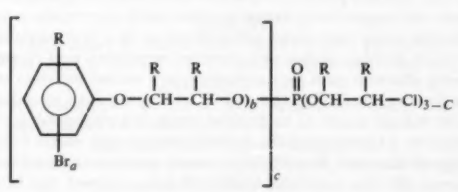
4,144,291

PROCESS FOR THE PREPARATION OF BROMOAROXYL-ALKYL-(β-CHLOROALKYL) PHOSPHATES

Karl-Heinz Mitschke, Odenthal, and Günther Boehmke, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 14, 1977, Ser. No. 851,257
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1976, 2653094
Int. Cl.[2] C07F *9/09*
U.S. Cl. 260—986 4 Claims

1. Process for the preparation of brominated aroxyalkyl-(β-chloroalkyl) phosphates of the general formula



wherein

R represents hydrogen, an alkoxy or alkyl radical having 1 to 8 C atoms, a perfluoroalkyl radical having 1-8 C atoms, or halogen,

a can assume values of 0.05 to 3.0,

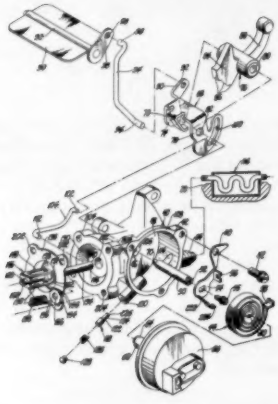
b can be 0, 1, 2 or 3 and
c can be 1 or 2
by brominating the corresponding aroxyalkyl-(β-chloroalkyl) phosphates, characterised in that aroxyalkyl-(β-chloroalkyl) phosphates are reacted at temperatures between about −10 and 80° C. with an approximately equimolar mixture of bromine and chlorine, especially bromine chloride.

4,144,292

DUAL DIAPHRAGM CHOKE ASSEMBLY

James L. Witt, Mt. Clemens, and Herbert T. LaMore, East Detroit, both of Mich., assignors to Colt Industries Operating Corp., New York, N.Y.

Filed Oct. 11, 1977, Ser. No. 840,770
Int. Cl.[2] F02M *1/10*
U.S. Cl. 261—39 B **1 Claim**



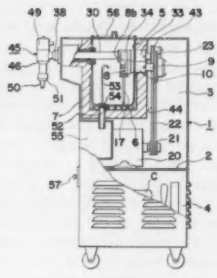
1. A choke control assembly for a choke valve of an internal combustion engine carburetor, comprising linkage means connectable to said choke valve for variably positioning said choke valve from a fully closed position to a fully opened position, resilient thermostatic means operatively connected to said linkage means, said thermostatic means being responsive to engine temperature and effective when said engine is below a predetermined minimum temperature for causing said linkage means to move as to fully close said choke valve, first and second pressure responsive movable wall means operatively connected to said linkage means, conduit means for communicating engine vacuum from a source of vacuum generated by said engine to said first and second pressure responsive wall means, said first pressure responsive wall means being effective upon said engine being started to move said linkage means as to thereby cause said choke valve to move to a first partially opened position, said second pressure responsive wall means being effective upon the occurrence of a second indicium of engine operation after said engine has been started to move said linkage means as to thereby cause said choke valve to move to a second partially opened position more nearly fully opened than said first partially opened position, and resilient means effective when said choke valve has attained said first partially opened position to resiliently oppose said thermostatic means and tend to further open said choke valve from said first partially opened position, said first and second pressure responsive wall means being arranged in tandem relationship to each other, and said resilient means forming an operative connection therebetween.

4,144,293

WHIPPED CREAM MAKING MACHINE

Hideaki Hamoto, Yamatokoriyama; Maao Ogino, Sakai; Mitsunobu Yoshida, Tenri; Yoshinari Mishima, Tenri, and Akiho Yoshizawa, Osaka, all of Japan, assignors to Kabushiki Kaisha Takarabune, Kyoto and Sharp Kabushiki Kaisha, Osaka, both of, Japan

Filed Sep. 26, 1977, Ser. No. 836,716
Claims priority, application Japan, Sep. 30, 1976, 51-117965; Oct. 28, 1976, 51-130158; Mar. 30, 1977, 52-39447[U]
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—93 **7 Claims**



1. A machine for introducing a gas into a liquid milk product capable of forming a foam, which comprises, in combination:
a housing structure including a container for accommodating a predetermined amount of liquid milk product;
a suction pump having a mixing chamber, a suction port in communication with said container and leading into the mixing chamber, a discharge port in communication with the mixing chamber and intake port means through which the gas is introduced into the mixing chamber, said suction pump being operable to mix the liquid milk product, sucked into the mixing chamber through the suction port, with the gas introduced into the mixing chamber through the intake port means and then to supply the resulant mixture under pressure towards the discharge port;
a first whipping barrel having one end coupled to the discharge port of the suction pump, said first whipping barrel having a substantially labyrinth passage defined therein, said mixture of gas and liquid milk product, which has been supplied under pressure into the first whipping barrel, being emulsified during its passage through the substantially labyrinth passage;
a second whipping barrel having one end coupled to the other end of the first whipping barrel, said second whipping barrel having therein means for stirring the emulsified mixture during the passage of the latter therethrough;
means including a shut-off valve for dispensing the emulsified mixture, which has been supplied under pressure towards the other end of the second whipping barrel, to the outside of the housing structure during the opening of said shut-off valve; and
a drive mechanism for driving the suction pump and also for driving said stirring means in the second whipping barrel.

4,144,294

METHOD OF CONDITIONING GARNETED POLYESTER FOR BLOW INJECTING AS INSULATION IN GOODS, AND APPARATUS THEREFOR

Martin S. Werthaiser, 4426 S. Fraser Ct., Denver, Colo. 80232, and Paul L. Legoski, 1261 Syracuse, Denver, Colo. 80220

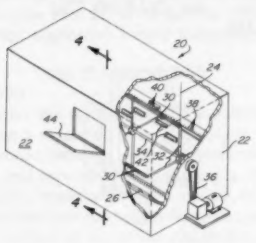
Filed Nov. 4, 1977, Ser. No. 848,574
Int. Cl.[2] B29C *23/00*
U.S. Cl. 264—15 **20 Claims**

1. A method of changing sheet-like segments of garneted polyester fibers into rounded bodies suitable for blow injecting through a blow injection path as insulation into a pocket

formed in goods for receiving the insulation, comprising the steps of:

providing at least one segment of garneted polyester fiber material,

separating each segment of garneted polyester fiber material into a plurality of smaller pieces, and



forming each of the small pieces into a generally rounded body, each of the rounded bodies being generally uniform in weight and size, the size of each of the rounded bodies being suitable for blow injecting into an insulation pocket without clogging the blow injection path, and each of the rounded bodies having randomly oriented polyester fibers therein, and each of the rounded bodies exhibiting substantial resiliency to permanent deformation.

4,144,295

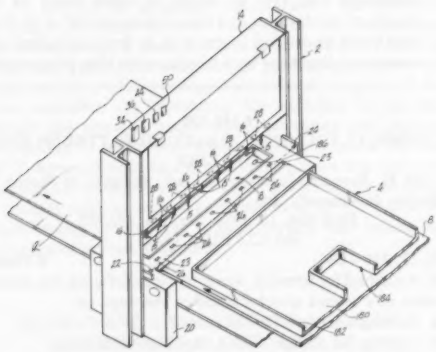
GENERATION OF POLYURETHANE FOAM

Gerald V. Dever, Jr., Trumbull, Conn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 762,555, Jan. 25, 1977. This application Jan. 30, 1978, Ser. No. 873,303

Int. Cl.[2] B29D *27/04*

U.S. Cl. 264—40.2 **2 Claims**



1. A method of generating foam from a mixture of foam-forming materials in a structure having a preformed configuration, said foam-forming materials being dispensed from a plurality of stationary foam gun heads having valve means therein for controlling the discharge of the foam-forming materials therefrom, said method comprising:

(a) conveying said structure along a horizontal path underneath said stationary foam gun heads with said foam gun heads having outlets being spaced transversely across said path;

(b) vertically sensing the presence of at least a portion of said structure at any one of a plurality of points upstream of said foam gun head outlets by a respective one of a plurality of vertical sensing means spaced from each other in a direction transverse to said horizontal path, each of said sensing means being associated with a respective one of said plurality foam gun heads;

(c) opening the valve means of said one foam gun head in response to its associated sensing means sensing the presence of said portion of the structure;

(d) closing said opened valve means when its associated sensing means is not sensing the presence of said structure; and

(e) reopening said closed valve means when its associated sensing means again senses presence of a portion of said structure, thereby automatically compensating for narrow width or openings of said structure.

4,144,296

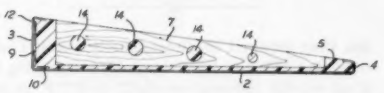
PROCESS FOR MOLDING A POLYSTYRENE FOAM STRUCTURE WITH A BONDED COVERING

Luther I. Dickens, Radford, Va., assignor to The Mead Corporation, Dayton, Ohio

Filed Jun. 23, 1976, Ser. No. 698,966

Int. Cl.[2] B29D *27/04, 3/00*

U.S. Cl. 264—45.4 **6 Claims**



1. A process for molding in situ in a mold with a female cavity and a male member a polystyrene foam structure with relatively rigid thermoplastic sheet bonded to at least a substantial portion of the top, edges, and sides of the structure which comprises:

(a) applying a heat-activated adhesive to one surface of a relatively rigid thermoplastic sheet, cutting the sheet to desired dimensions, and folding the sheet to form a folded sheet to the desired shape of the structure;

(b) inserting the folded sheet into the female cavity of a mold so that the coated surface is exposed to the male member of the mold and attaching a plurality of reinforcing ribs with a plurality of transfer holes to the male member of the mold before closing so that the ribs project perpendicular from the male member, said ribs having a depth at least equal to a major portion of the depth of the female cavity so as to reinforce the structure molded;

(c) injecting heat expandable polystyrene molding material into the interior of the folded sheet;

(d) heating the polystyrene sufficiently to expand it to fill the interior of the folded sheet with polystyrene being transferred through the transfer holes so the density of the structure molded is fairly uniform and to force the sheet against the interior surface of the female cavity and heating the adhesive so that the sheet is bonded to the polystyrene; and

(e) removing the structure from the mold.

4,144,297

METHOD OF INJECTION MOLDING A FOAMED THERMOPLASTIC RESIN BALL CORE HAVING AN INTEGRAL SKIN

Julius Tomar, Port-au-Prince, Haiti, assignor to Home of Champions, S. A., Port-au-Prince, Haiti

Filed Dec. 7, 1977, Ser. No. 858,415

Claims priority, application Haiti, Dec. 28, 1976, 139-Reg. 4

Int. Cl.[2] B29D *27/00*

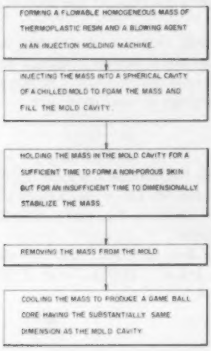
U.S. Cl. 264—45.5 **9 Claims**

1. A method of forming a game ball core comprising:

forming a flowable homogeneous mass from a thermoplastic resin and a blowing agent by the application of heat and pressure thereto in an injection molding machine;

injecting said mass into the spherical cavity of a mold cooled to 32° to 65° F. to foam said mass and fill the mold cavity;

holding said mass in the mold cavity for a sufficient time to form a non-porous skin on the outer surface of said mass, said skin being of adequate strength to prevent rupture of the skin by blowing agent contained within the mass upon removal of said mass from the mold cavity, said time being


FORMING A FLOWABLE HOMOGENEOUS MASS OF THERMOPLASTIC RESIN AND A BLOWING AGENT IN AN INJECTION MOLDING MACHINE.
INJECTING THE MASS INTO A SPHERICAL CAVITY OF A CHILLED MOLD TO FOAM THE MASS AND FILL THE MOLD CAVITY.
HOLDING THE MASS IN THE MOLD CAVITY FOR A SUFFICIENT TIME TO FORM A NON-POROUS SKIN BUT FOR AN INSUFFICIENT TIME TO DIMENSIONALLY STABILIZE THE MASS.
REMOVING THE MASS FROM THE MOLD.
COOLING THE MASS TO PRODUCE A GAME BALL CORE HAVING THE SUBSTANTIALLY SAME DIMENSION AS THE MOLD CAVITY.

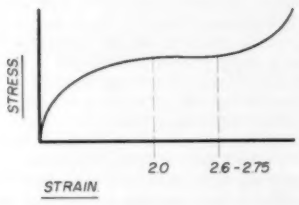
less than required to dimensionally stabilize said mass; removing said mass from the mold; and cooling said mass at an exterior temperature of 32° to 65° F. to produce a game ball core having a dimension substantially the same as the mold cavity.

4,144,298

METHOD OF FORMING STRAIN CRYSTALLIZED THERMOPLASTIC ARTICLES

Soo-Il Lee, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 4, 1977, Ser. No. 821,943
Int. Cl.[2] B29C *17/07*
U.S. Cl. 264—532 **18 Claims**



1. In a method of pre-conditioning a tubular parison of polyethylene terephthalate material preparatory to a blow molding operation so that a highly-developed strain crystallized morphology may be developed in the material during a blow molding operation, the method comprising the steps of:

(a) thermally conditioning the tubular parison to a temperature conducive to molecular orientation in the range of from about 75° C. to about 110° C.;

(b) stretching the parison while in said temperature range to achieve an areal strain in the material of from about 2.0 to about 2.75;

(c) cooling the stretched parison to a temperature at or below the glass transition temperature for the material in the range of from about 60° C. to about 75° C.;

(d) further stretching the cooled parison to achieve an areal strain in the material of from about 2.4 to about 3.0;

(e) heating the parison to a temperature in a range conducive to molecular orientation; and

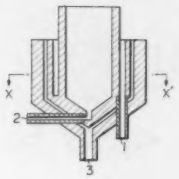
(f) expanding the parison within a blow mold cavity to form a final blown article.

4,144,299

PROCESS FOR PRODUCING ACRYLONITRILE POLYMER FILM

Akio Inoue; Toshio Iwasa; Kiichiro Sasaguri; Toshihiko Amano, and Junji Nomura, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 12, 1977, Ser. No. 832,484
Int. Cl.[2] B29D *7/24*
U.S. Cl. 264—558 **5 Claims**



1. A process for producing an acrylonitrile polymer film, which comprises the steps of:

extruding an acrylonitrile polymer solution in a tubular shape into a coagulation liquid bath while a coagulation liquid is introduced into and withdrawn from inside of the extruded tubular-shaped film, whereby said coagulation of the extruded tubular-shaped film proceeds simultaneously from both surfaces thereof;

removing the solvent remaining in the coagulated tubular film until the residual solvent content reaches below 20% by weight based on the weight of the dried film, and, simultaneously therewith or thereafter, maintaining the coagulated tubular film at a temperature of from 50° to 150° C. to adjust the water content in the tubular film to the range of from 5% to 35% by weight based on the weight of the dry film, and;

biaxially stretching the tubular film maintained in the state of containing 5 to 35% by weight of water based on the weight of the dry film, at a temperature of 100°–170° C. at least twice its original length both in the longitudinal and transverse directions by a tubular stretching procedure.

4,144,300

CHEMICAL ETCHING OF RECORD PATTERNS AND THE LIKE

Arnold H. Breeden, Indianapolis, Ind., assignor to Joseph P. Rolles, Indianapolis, Ind.

Filed Sep. 15, 1976, Ser. No. 723,575
Int. Cl.[2] B29D *17/00*
U.S. Cl. 264—106 **8 Claims**

1. A method for forming characters in relief upon the central portion of a record which comprises the steps of:

a. forming a pattern for the record;

b. coating the pattern with a photo-sensitive resist;

c. placing upon the resist a sheet having an image of the characters and of a guide portion against a background, the characters and the background being distinguishable by one being opaque and the other being transparent;

d. exposing the resist to a suitable light source to harden the portion of resist exposed to the light through the transparent portion of the sheet;

e. developing the resist;

f. removing the soft portion of the resist from the pattern;

g. etching the pattern to remove a portion of the pattern material from the surface from which the soft portion of the resist has been removed;

h. after substep g., removing the hardened resist from the pattern; and

i. forming the record from the pattern utilizing the guide portion for centering the etched characters.

4,144,301
SEPARATORS FOR ELECTROLYTIC CELLS

Lionel B. Adams; Peter J. Fydelor; Gordon Partridge, and Kenneth B. Pithouse, all of Swindon, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Division of Ser. No. 400,669, Sep. 25, 1973, abandoned. This application Feb. 12, 1976, Ser. No. 657,629

Claims priority, application United Kingdom, Sep. 25, 1972, 44137/72

Int. Cl.[2] H01M *3/00*

U.S. Cl. 264—126 **9 Claims**

1. A process for the production of a moulding of polymer material forming a separator in an electrolytic cell, having a separator positioned between a positive electrode and a negative electrode, said process including the step of depositing a particulate polymer material having a nucleus of thermoplastic polymer material surrounded by a polar graft copolymer layer grafted on the surface of one of the electrodes and thereafter sintering said thus deposited particulate polymer material into a coherent coating around the electrode using heat and/or pressure, wherein said particulate polymer material comprises particles having a nucleus of thermoplastic polymer material surrounded by a cross-linked polymer layer and an outer polar graft copolymer layer wherein at least 30% by weight of the particles have a diameter of less than 100μm.

4,144,302
PROCESS FOR PREPARING INJECTION MOLDABLE THERMOSETTABLE COMPOSITION

Thornton R. Calkins, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 500,113, Aug. 23, 1974, Pat. No. 3,978,012, which is a continuation-in-part of Ser. No. 303,844, Nov. 6, 1972, abandoned. This application Jul. 22, 1976, Ser. No. 707,542

Int. Cl.[2] C08G *8/00*; B29H *21/04*

U.S. Cl. 264—130 **9 Claims**

1. A process for preparing a heat fusible thermosettable molding composition in pellet form which composition comprises in admixture a thermosettable phenol-aldehyde resin and a filler and which process consists of (a) feeding a heat fusible thermosettable molding composition at room temperature to a screw extruder, (b) advancing the molding composition through the screw extruder while subjecting said molding composition to an elevated molding temperature of less than 290° F. for a sufficient time to render the phenol-aldehyde resin molten, (c) extruding the said composition through a die orifice of the said extruder, and (d) comminuting the extrudate into pellets having a relatively smooth surface and having one dimension of at least 1/16 inch.

4,144,303
METHOD AND APPARATUS FOR MOLDING A COMPOSITE PLASTIC ARTICLE

Jack E. Glatt, Barrington; Jacob J. Detzel, Richmond, and Richard Lane, Streamwood, all of Ill., assignors to Keolyn Plastics, Inc., Mount Prospect, Ill.

Filed Aug. 29, 1977, Ser. No. 828,680

Int. Cl.[2] B29D *3/00*; B29F *1/00*

U.S. Cl. 264—138 **3 Claims**

1. A method of molding a composite plastic article in which a piece of plastic film is fused to the outer surface of the plastic article at a location away from the main parting line of the mold, said method including the steps of:

closing a pair of mold members along a main parting line to establish a mold cavity,

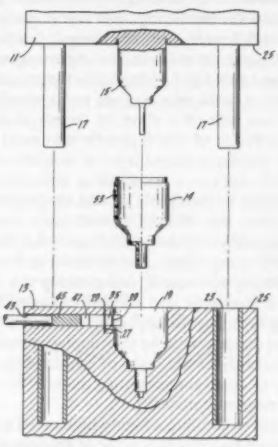
providing an auxiliary opening into the mold cavity through one of the mold members at a location away from the main parting line,

providing a separate closing member for the mold cavity auxiliary opening with the closing member having cutting edges around the perimeter thereof,

positioning a strip of plastic film with dimensions greater than those defined by the cutting edges of the auxiliary closing member between the auxiliary closing member and the auxiliary opening of the mold cavity,

moving said auxiliary closing member through said strip of film and into a die to sever a piece of film from said strip,

carrying said severed piece of film on said auxiliary closing member to said mold cavity auxiliary opening to position



said piece of film at least partially into the mold cavity and to close the auxiliary opening,

holding the severed piece of film on said auxiliary closing member only by catching projecting portions of said film between the auxiliary closing member and walls defining said auxiliary opening through which said auxiliary closing member passes, and

injecting molten plastic into said mold cavity while supporting said piece of film in said auxiliary opening until said piece of film is fused to said molten plastic.

4,144,304
PROCESS FOR THE MANUFACTURE OF SHEETS FROM A MIXTURE OF VEGETABLE FIBRES AND POLYOLEFINE

Michel Dereppe, Brussels, and Antoine Deryckere, Sint-Pieters-Leeuw, both of Belgium, assignors to Solvay & Cie, Brussels, Belgium

Filed Aug. 11, 1976, Ser. No. 713,482

Claims priority, application Luxembourg, Aug. 29, 1975, 73279

Int. Cl.[2] B29D *7/14*

U.S. Cl. 264—175 **8 Claims**

1. Process for the manufacture of sheets having a high resistance to water absorption, from a mixture of vegetable fibres and polyolefine, where a homogenous mixture is produced from 25 to 75% by weight of vegetable fibres and from 75 to 25% by weight of molten polyolefine and in that this mixture is sheeted by hot calendering at a temperature at least equal to the melting point of the polyolefine, the hot calendering being carried out on a calender having a plurality of rolls all of which are heated at the surface to a temperature above the melting point of the polyolefine.

4,144,305

METHOD OF OBTAINING INTERFACE ADHESION BETWEEN THERMOSETTING LAYERS WHICH CONTAIN MOLD RELEASE AGENTS

Walter D. Cottrell, Jr., Newark, and Ralph B. Jutte, Jr., Granville, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 558,405, Mar. 14, 1975, abandoned. This application Aug. 2, 1976, Ser. No. 710,979
Int. Cl.[2] B29C *9/00, 6/02;* B29D *9/00*
U.S. Cl. 264—247 15 Claims

1. In the method of producing molded plastic parts wherein first and second thermosetting resin layers are positioned between male and female dies and shaped, bonded and cured under applied pressure and heat, the improvement comprising: superimposing a first layer of moldable thermosetting material which contains a mold release agent and a crosslinking monomer against one side of a sheet of thermoplastic polymeric material the polymer of which absorbs said mold release agent when heated, placing a second layer of moldable thermosetting material which contains a crosslinking monomer, and a mold release agent that is absorbable by said thermoplastic polymer against the other side of said thermoplastic sheet to form a composite, said sheet of thermoplastic polymer being but a few mils thick, and being dissolvable at molding temperatures by said cross linking monomers, compressing the composite to force the three materials into intimate contact, and curing the thermosetting layers by the application of heat while the layers are in intimate contact with the thermoplastic material, thereby adhering the cured second layer of thermosetting material to the first layer of cured thermosetting material by means of said sheet of thermoplastic material.

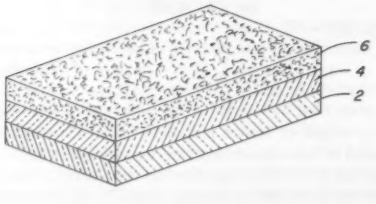
15. A method of bonding a highly pigmented and filled layer of thermosetting material to a layer of thermosetting material containing glass fiber reinforcement, said method comprising: preparing a first moldable mixture of a thermosetting material, a crosslinking solvent therefor, mold release agent, filler and pigment; preparing a second moldable mixture of thermosetting material, a crosslinking solvent therefor and glass fiber reinforcement; preparing a sandwich of a thermoplastic sheet which is softened by said crosslinking solvents, and said moldable mixtures with a layer of said first mixture positioned against one surface of said sheet and a layer of said second mixture positioned against the other surface of said sheet; said thermoplastic sheet being but a few mils thick, placing the surface of said sandwich formed by said first mixture against a heated surface; and applying pressure against the opposite surface of said sandwich to simultaneously compress, shape, and cure said sandwich against said heated surface.

4,144,306

ELEMENT FOR ANALYSIS OF LIQUIDS

John Figueras, Victor, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 759,527, Jan. 14, 1977, abandoned. This application Feb. 13, 1978, Ser. No. 877,193
Int. Cl.[2] G01N *31/14, 33/16, 21/06*
U.S. Cl. 422—56 45 Claims



1. A multilayer analytical element for analysis of liquid containing a predetermined analyte, the element comprising a reagent layer and a registration layer,

(a) said reagent layer comprising a composition including a non-diffusible material comprising a preformed, detectable moiety said composition being interactive in the presence of liquid containing said analyte to provide a diffusible species comprising the preformed, detectable moiety and

(b) said registration layer adapted to receive said diffusible species,

wherein layers within the element are composed such that said preformed, detectable moiety released from the reagent layer can be detected selectively within the element.

4,144,307

INTERNALLY COATED REACTION VESSEL FOR USE IN OLEFINIC POLYMERIZATION

Louis Cohen, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 807,957, Jun. 20, 1977, Pat. No. 4,105,840. This application Nov. 7, 1977, Ser. No. 848,843
Int. Cl.[2] C08F *10/00;* B01J *1/20*
U.S. Cl. 422—131 9 Claims

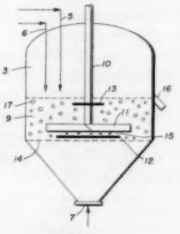
1. A polymerization reaction vessel for making polymeric materials having on all the internal surfaces thereof a coating comprised of a tannin selected from the group consisting of hydrolyzable tannins, condensed tannins, ammonium tannates and tannins complexed with metal ions, and an antioxidant, said coating having a thickness of about 20A or less and being capable of resisting polymer buildup thereon.

4,144,308

SOLIDIFICATION AND CRYSTALLIZATION OF MATERIALS

Anders A. Johnson, Webster Groves, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 523,094, Nov. 12, 1974, Pat. No. 4,022,820. This application Jan. 3, 1977, Ser. No. 756,320
Int. Cl.[2] B01D *9/02*
U.S. Cl. 422—245 9 Claims



1. Apparatus comprising:

a. a vessel adapted for solidification and crystallization of liquid material;

b. aperture means in said vessel adapted for introduction of liquid material;

c. aperture means in said vessel adapted for removal of solid product;

d. aperture means in said vessel adapted for introduction of fluidizing gas;

e. support means within said vessel adapted to retain a bed of solid particles;

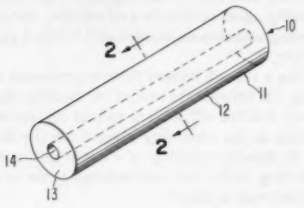
f. agitator means within said vessel spaced above said support means and adapted to fluidize said bed by pushing said particles down toward said support means; and

g. gas dispersion means within said vessel adapted to direct the flow of said fluidizing gas to the periphery of said fluidized bed.

4,144,309
DEVICE FOR DISPENSING MICROCIDE FORMED WHEN DEVICE IS IN ENVIRONMENT OF USE

Jimmy B. Langston, San Jose; Harold Leeper, Mountain View, and Patrick S. Wong, Palo Alto, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed Jun. 9, 1977, Ser. No. 804,961
Int. Cl.[2] A61L *9/04*
U.S. Cl. 422—305 **3 Claims**

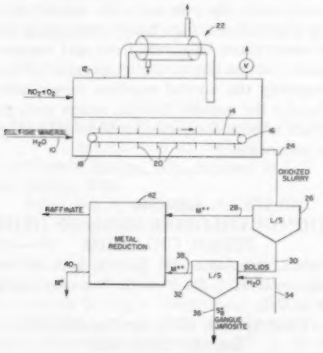


1. A device for dispensing para-formaldehyde to an environment of use, the device consisting essentially of:
(a) a body shaped, sized and adapted for placement in the environment of use, the body formed of a first polymeric material stable in the environment of use and permeable to the passage of moisture and housing a second and different polymer para-formaldehyde;
(b) a surface exposed to the environment of use defining at least one part of the body formed of said first polymeric material for providing formaldehyde to the enviornment of use; and
(c) wherein, when the device is in the environment of use, the first polymeric material provides at the surface thereof para-formaldehyde that is converted in the presence of the moisture in the environment of use to formaldehyde, which formaldehyde substantially controls the presence of unwanted microorganisms in the environment of use over prolonged periods of time.

4,144,310
HIGH SLURRY DENSITY SULFIDIC MINERAL LEACHING USING NITROGEN DIOXIDE

Theodore C. Frankiewicz, Westminster, Calif., and Robert E. Lueders, Needham, Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Nov. 30, 1977, Ser. No. 856,201
Int. Cl.[2] C01G *3/10, 9/06, 53/10*
U.S. Cl. 423—27 **12 Claims**

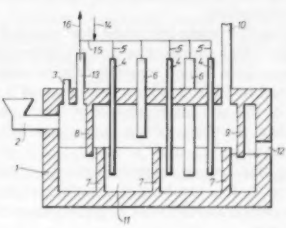


7. A process for oxidizing a sulfidic mineral containing metal values of at least one metal selected from the group consisting of copper, silver, nickel, cobalt, molybdenum, zinc, iron and mixtures thereof to enable at least one of the metal values to be leached therefrom comprising the following steps:
A. adding a sufficient amount of water to the sulfidic material while in particulate form to produce a noncaking slurry having a solids content of no less than 30% by weight;
B. contacting the slurry with an oxygen and nitrogen dioxide containing gas, the amount of nitrogen dioxide gas being in excess of the stoichiometric amount needed to oxidize the sulfidic material being treated; and,
C. agitating the slurry to increase contact between the nitrogen dioxide gas and the sulfidic material and allow the nitrogen dioxide gas to oxidize the sulfidic material and render at least one metal value leachable, the reacted nitrogen dioxide being reduced to nitric oxide which is oxidized to nitrogen dioxide by the oxygen.

4,144,311
PURIFYING SALTS CONTAINING ORGANIC POLLUTANTS

Michael Grosche; Roland Höfer, and Arnd Stüwe, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 18, 1977, Ser. No. 817,078
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1976, 2632954
Int. Cl.[2] C01F *11/16;* **C01D** *5/16*
U.S. Cl. 423—155 **7 Claims**



1. A process for removing organics from a sulphate. chloride, phosphate or nitrate salt of an alkali or alkaline earth metal or sludges thereof polluted with about 1 to 70% by weight of organic substances, based on said salt, comprising continuously supplying and forming a melt of said salt at a temperature of from about 600° to 1000° C. by direct electrode resistance heating, contacting said formed melt with an oxygen-containing gas in a plurality of successive stages while advancing the salt through said stages, continuously withdrawing purified salt as a product from the last stage, and continuously withdrawing waste gases.

4,144,312
DESULFURIZATION OF FLUORITE ORES

Claude H. P. Lupis, 900 Hastings St., Pittsburgh, Pa. 15217

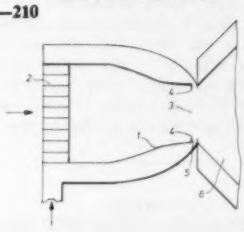
Filed Apr. 13, 1977, Ser. No. 787,240
Int. Cl.[2] C01F *11/22*
U.S. Cl. 423—178 **20 Claims**

1. A method for reducing the sulphur content of fluorite ore or concentrate containing sulphur in the form of metal sulphates as an impurity which method comprises heating said fluorite ore or concentrate at temperatures between 700° and 1,000° C. under reducing conditions whereby said metal sulphates are transformed into metal oxides, and removing the sulphur in the form of gaseous compounds of sulphur via the effluent gases.

4,144,313
METHOD OF PURIFYING GASES BY COMBUSTION

Rolf Germerdonk, Bergisch-Gladbach; Götz-Gerald Börger, Monheim, and Werner Hüning, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 19, 1977, Ser. No. 798,727
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1976, 2625139; Sep. 29, 1976, 2643732
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—210 **2 Claims**



1. In the complete and safe purification of waste gases which contain organic or inorganic combustible substances by thermal decomposition at temperatures between about 800° C. and 1000° C., wherein the amount of waste gas supplied to an inlet varies in time within wide limits and also the concentration of oxygen and combustible substances varies in such a way that the lower explosion limit is at times exceeded in the waste gas and wherein supplementary fuel is optionally added for the maintenance of the decomposition temperature, the improvement which comprises

(a) adding to the waste gas to be decomposed fresh air or waste gas which contains no combustible substances in a constant amount which maintains the incoming flow rate W_o defined in FIG. 3 within the range of 3 and 20% by volume of the maximum amount of waste gas,

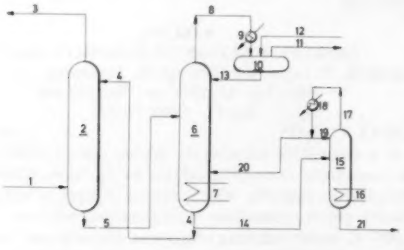
(b) rendering the flow of the waste gas mixture largely laminar and

(c) feeding this largely laminar flowing mixture of waste gases directly to a combustion chamber while removing at the inlet orifice an inlet wall boundary layer of a height of 0.2 to 3 mm.

4,144,314
PROCESS FOR REGENERATING WATER-CONTAINING METHANOL

Alexander Doerges, and Johannes Schlauer, both of Frankfurt am Main, Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 26, 1977, Ser. No. 836,467
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1976, 2644323
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—210 **15 Claims**



1. In a process for regeneration of water-containing methanol or water-containing, highly volatile organic solvent, having a boiling point less than water, which has been used to scrub the acid constituents of a gas having a low content of water and of volatile compounds of metals of the eighth group of the Periodic System, wherein said laden solvent is regenerated by heating and/or flashing and/or stripping the same in a regeneration zone to drive off acid constituents absorbed thereby and deacidified regenerated solvent is recycled to the scrubbing process, the improvement which comprises:

A. contacting said solvent during said regeneration with a complexing agent soluble in said solvent, said complexing agent being added in an amount of 0.005 to 1 gram per liter of solvent;

B. removing a branch stream from regenerated solvent and distilling off solvent therefrom by heating the same and returning distilled off solvent to said regeneration zone;

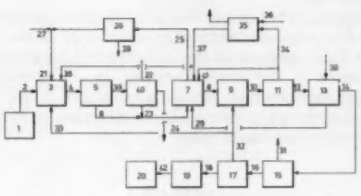
C. removing as the remaining phase from the distillation of step B an aqueous solution of a metal salt; and

D. introducing water into said solvent cycle to replace the water removed in step C.

4,144,315
PRODUCTION OF HYDROGEN FLUORIDE

Ralph E. Worthington, Winter Haven, Fla.; Padraic S. O'Neill, Baton Rouge, La., and Paul F. X. Hackett, Greystones, Ireland, assignors to Goulding Chemicals Limited, Dublin, Ireland

Filed Aug. 15, 1977, Ser. No. 824,508
Claims priority, application Ireland, Aug. 26, 1976, 1909/76
Int. Cl.[2] C01D *3/02*
U.S. Cl. 423—490 **7 Claims**



1. A process for preparing sodium bifluoride, which comprises feeding aqueous ammonium fluoride to a continuously operated reactor containing a mixture of ammonium fluoride and ammonium bifluoride in aqueous solution, the mixture containing 7.0 to 11.0 moles per liter of fluoride ions and 2.5 to 6.0 moles per liter of bifluoride ions, and boiling at a temperature of from 130° to 150° C. under a pressure of from 10 to 30 psig, whereby there is a net production of ammonium bifluoride from ammonium fluoride with the release of ammonia; withdrawing aqueous reaction liquor containing ammonium fluoride and ammonium bifluoride from said reactor; cooling the withdrawn reaction liquor to a temperature of from 10° to 50° C.; contacting the cooled reaction liquor with sodium fluoride whereby the sodium fluoride reacts with the ammonium bifluoride to produce sodium bifluoride; and recovering said sodium bifluoride.

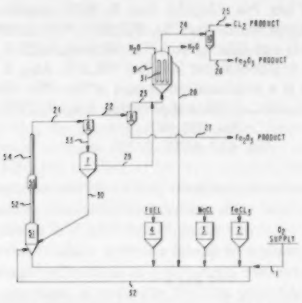
4,144,316
PRODUCTION OF CHLORINE AND IRON OXIDE FROM FERRIC CHLORIDE

David J. Haack, and James W. Reeves, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 24, 1978, Ser. No. 899,695
Int. Cl.[2] C01B *7/03*
U.S. Cl. 423—502 **4 Claims**

1. In a process for producing chlorine and iron oxide in a fluidized-bed reactor by treating ferric chloride in the vapor phase with an excess of oxygen at a temperature of 550° to 800°

C. in the presence of a catalyst made from sodium chloride and iron oxide, wherein a carbonaceous fuel is fed to the reactor bed to supply supplemental heat, the improvement comprising continuously recirculating a portion of the bed material from the reactor back to the reactor and supplying the fuel as a dry,



pulverized solid in an amount equal to between 1 and 9 percent of the weight of the iron chloride fed to the reactor, the fuel having a stable ignition temperature in air of no greater than 500° C. and containing between 0.5 and 2.5 percent of hydrogen based on the weight of the fuel.

4,144,317

DEVICE CONSISTING OF COPOLYMER HAVING ACETOXY GROUPS FOR DELIVERING DRUGS

Takeru Higuchi, Lawrence, Kans., and Anwar Hussain, Lexington, Ky., assignors to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 582,353, May 30, 1975, Pat. No. 4,069,307, which is a division of Ser. No. 281,446, Aug. 17, 1972, Pat. No. 3,903,880, which is a continuation-in-part of Ser. No. 80,531, Oct. 14, 1970, abandoned. This application Sep. 21, 1977, Ser. No. 835,319

The portion of the term of this patent subsequent to Sep. 9, 1992, has been disclaimed.

Int. Cl.[2] **A61K** *9/22, 9/24, 9/52*

U.S. Cl. 424—21 **6 Claims**

1. In a drug delivery device for releasing locally and systemically acting solid, semi-solid and liquid drugs over a prolonged period of time, the device consisting of a drug reservoir containing the drug in an amount for producing a desired physiologic and pharmacologic effect over the time period the device produces therapy, and a polymeric barrier through which the drug passes by diffusion, the improvement wherein said polymeric barrier is a biologically acceptable ethylene-vinyl acetate copolymer having a vinyl acetate content of about 4 to 80% by weight and a melt index of about 0.1 to 1000 grams per ten minutes, with the drug dissolving in and passing through the ethylene-vinyl acetate copolymer by diffusion at a controlled therapeutically effective rate over the prolonged period of time.

4,144,318

MOSQUITO COIL COMPOSITION AND PROCESS FOR MAKING THE SAME

Vincent T. D'Orazio, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Aug. 5, 1977, Ser. No. 822,108

Int. Cl.[2] **A01N** *17/04*

U.S. Cl. 424—40 **2 Claims**

1. A process for preparing mosquito coils comprising:
(a) Dispersing from 16–26% by weight on a dry basis potato starch in water having a temperature of from 40–60° C.;
(b) Gelling the dispersed starch by adding sufficient water having a temperature of from 80–95° C. to the starch-water dispersion to raise the temperature of the resulting mixture to above the gelling point of the starch;
(c) Adding from 72–83% by weight on a dry basis of a carrier, from 0.5—3% by weight on a dry basis of an insecticide and from 0–2% by weight on a dry basis of a burning aid to the gelled starch-water mixture;
(d) Forming thin sheets from the carrier starch-water mixture;
(e) Forming mosquito coils from the thin sheets; and
(f) Drying the formed mosquito coils with the proviso that the ratio of dry ingredients to water is within the range of from 1:1–1:2.5.

4,144,319

METHOD OF INHIBITING SKIN IRRITATION

Sharon G. Willer, Loveland; Paul R. Yust, and Ralph Kelly, both of Cincinnati, all of Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

Division of Ser. No. 319,030, Dec. 27, 1972, Pat. No. 4,076,799. This application Jan. 20, 1978, Ser. No. 871,012

Int. Cl.[2] **A61L** *9/04;* **A61K** *31/74, 31/25, 31/23*

U.S. Cl. 424—45 **12 Claims**

1. A method for preventing or reducing irritation of the skin caused by contact with a skin irritating allergenic agent which comprises applying to the skin of a subject sensitized to said allergenic agent, prior to contact with said skin irritating allergenic agent, a protective agent containing at least two polar groups separated by a chain of at least 15 atoms, the majority of which are carbon atoms; wherein said protective agent is selected from the group consisting of esters and polyesters of an acid comprising the unsaturated polymerized product obtained from the polymerization of 2 to 4 molecules of a monomeric ethylenically unsaturated C_{12} to C_{26} fatty acid or the saturated derivative product of said polymerized product, said product or derivative product containing 2 to 4 carboxyl groups and a hydroxy compound comprising a polyoxyalkylene ether containing 2 to 30 oxyalkylene units in which the alkylene radical contains 2 to 4 carbon atoms.

4,144,320

AMINOALCOHOLS

Sven E. H. Hernestam; Nils A. Nilsson, both of Malmö, and Lars-Olof Willard, Hollviksnäs, all of Sweden, assignors to AB Ferrosan, Malmö, Sweden

Filed Apr. 12, 1977, Ser. No. 786,951

Claims priority, application United Kingdom, Apr. 20, 1976, 15971/76

Int. Cl.[2] **A61K** *9/68*

U.S. Cl. 424—48 **7 Claims**

1. A compound consisting of N-n-butyl-N-cetyl-6-amino-1-hexanol.

4,144,321

AMORPHOUS PRECIPITATED SILICEOUS PIGMENTS AND METHODS FOR THEIR PRODUCTION

Satish K. Wason, Churchville, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Continuation-in-part of Ser. No. 519,720, Oct. 31, 1974, Pat. No. 3,988,162, which is a continuation-in-part of Ser. No. 286,655, Sep. 6, 1972, Pat. No. 3,893,840. This application Jan. 30, 1976, Ser. No. 653,720

Int. Cl.[2] **A61K** *7/16;* **C09C** *1/30;* **C08H** *17/04*

U.S. Cl. 424—49 **2 Claims**

1. A visually clear toothpaste composition comprising a particulate solid polishing agent in a liquid phase, characterized in that the polishing agent comprises a synthetic precipitated amorphous silica, said synthetic precipitated amorphous silica being present in said composition in an amount of from about 15 to about 50% by weight of the toothpaste, and said synthetic precipitated silica having substantially the same refractive index as said liquid phase; and said amorphous silica comprising silica micelles or aggregates which have been milled to the desired degree of fineness; said silica being effective to function to remove stains, food, debris, and plaque from

the human tooth surface by providing good cleaning action at acceptable abrasion levels without imparting undesirable opacity to the toothpaste and having a Radioactive Dentin Abrasion value in the range of at least above 50, said silica aggregates thereby being substantially free of precipitated silicas which have substantially no cleaning ability on human teeth, and have initially small particle sizes, and are substantially free of the ease of breakdown into small particle sizes, thus resulting in good cleaning ability.

4,144,322

REDUCTION OF ABRASIVENESS IN DENTRIFICES

Martin Cordon, Highland, and Robert E. Dickson, Belle Mead, both of N.J., assignors to Colgate Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 544,618, Jan. 28, 1975, abandoned. This application Dec. 27, 1976, Ser. No. 754,464

Int. Cl.[2] A61K *7/16*

U.S. Cl. 424—49 **9 Claims**

1. A dentifrice toothpaste of superior cleaning and polishing characteristics having a pH maintained above about 7, comprising an alkali metal or alkaline earth metal aluminosilicate as a siliceous abrasive and flat flakes or crystals of alpha alumina as a calcined alumina abrasive having a particle size of about 1 to 15 microns in diameter and in an amount to provide a radioactive enamel abrasion to the dentifrice of above about 450, said calcined alumina being present in an amount of at least 7.5% and up to 20% by weight, and said siliceous abrasive being present in an amount of at least 10% and up to 70% by weight of said dentifrice, and about 0.1 to 5% by weight of a calcium, magnesium or sodium salt, selected from the group consisting of the carbonates, bicarbonates, chlorides, phosphates, silicates and nitrates, so as to reduce said enamel abrasion of the dentifrice.

4,144,323

NOVEL ANTICALCULUS COMPOSITIONS

Vincent Lamberti, Upper Saddle River, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Jun. 15, 1978, Ser. No. 916,032

Int. Cl.[2] A61K *7/16*

U.S. Cl. 424—54 **14 Claims**

1. A relatively non-astringent composition having a pH of about 7 or less for controlling plaque and calculus comprising as an active ingredient an effective amount to control said plaque and calculus of at least one compound or hydrate of a compound of the formula

$$Zn_xM_y(CMOS)_n$$

wherein n is 1 or 2 and

(a) when n is 1, x and y are both 1 and M is H^+, Na^+, K^+, Li^+, NH_4^+ or a C_{10} to C_{18} alkyl substituted ammonium cation;

(b) when n is 2, x and y are independently 1 or 2 and the sum of x + y is 3 and M is Ca^{++}, Mg^{++} or Zn^+

in admixture with an acceptable oral medium compatible with said compound or said hydrate.

4,144,324

ORAL COMPOSITIONS FOR CALCULUS RETARDATION

Marvin M. Crutchfield, St. Louis, and Keun Y. Kim, Chesterfield, both of Mo., assignors to Colgate Palmolive Company, New York, N.Y.

Continuation of Ser. No. 730,930, Oct. 8, 1976, abandoned, which is a continuation of Ser. No. 627,987, Nov. 3, 1975, abandoned, which is a division of Ser. No. 549,647, Feb. 13, 1975, abandoned, which is a division of Ser. No. 386,121, Aug. 6, 1973, abandoned, which is a continuation-in-part of Ser. No. 198,439, Nov. 12, 1977, abandoned. This application Aug. 7, 1978, Ser. No. 931,697

Int. Cl.[2] A61K *7/22*

U.S. Cl. 424—54 **6 Claims**

1. A process for the intentional ingestion of an oral composition which is ingested with contact with exposed dental surfaces by humans or lower animals and which is effective in inhibiting the formation of dental calculus without adversely affecting tooth structure comprising intentionally ingesting a dental calculus inhibiting amount effective in amounts much too small to chelate any appreciable quantities of calcium, to retard the conversion of amorphous calcium phosphate to crystalline calcium hydroxyappatite, which amount is about 0.01% to about 10% by weight, of a physiologically acceptable polyamine polyphosphonate selected from the group consisting of those of the formula:

wherein n is a number from 1 to 10, or a pharmaceutically acceptable water soluble salt thereof selected from the group consisting of alkali metal, ammonium and mono-, di- and triethanolammonium salts; the pH of the oral composition being within the range of at least about 5.0 to about 11.0, in order to thereby avoid occurrence of damage to dental enamel below about pH 5.0 and in order to retard the development of dental calculus without removing calcium from dental enamel or otherwise damaging the tooth structure; said oral composition being free of sources of calcium which would yield enough soluble calcium to significantly impair the anticalculus activity of said polyphosponate.

4,144,325

METHOD OF AND COMPOSITION FOR PREVENTING SUNBURN WHILE AFFORDING TANNING

Walter F. Voyt, Rte. 1, Box 43, Elwood, Ill. 60421

Filed Nov. 10, 1976, Ser. No. 740,646

Int. Cl.[2] A61K *7/42, 7/44, 31/355*

U.S. Cl. 424—59 **26 Claims**

1. A method of preventing erythema of the skin caused by the absorption of burning ultraviolet radiation resulting from exposure to natural or artificial sources thereof while concomitantly allowing tanning of the skin consisting of the application of a sunscreen composition demonstrating selective ultraviolet radiation absorption in the 295–315 nanometer wavelength range prior to exposure of the skin to said radiation source, said composition comprising a sunscreen-effective amount of an ultraviolet-absorbing tocopherol compound selected from the group consisting of alpha tocopherol, beta tocopherol, gamma tocopherol, delta tocopherol, epsilon tocopherol, zeta tocopherol, eta tocopherol and mixtures thereof, and an inert carrier vehicle for said tocopherol compound, said vehicle being non-toxic and non-irritating to the skin.

4,144,326

OIL FREE, WATER-SOLUBLE, CLEAR CREME RINSE FOR HAIR

Oscar B. Luedicke, Jr., Butler, and Francis M. Gichia, Paterson, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 578,438, May 19, 1975, abandoned. This application Feb. 22, 1977, Ser. No. 770,874

Int. Cl.[2] A61K *7/08*

U.S. Cl. 424—70 2 Claims

1. An aqueous water white creme rinse composition for improving the condition of the hair subsequent to a shampoo operation wherein the conditioning agent consists essentially of from 0.5% to 10% of lauryl trimethyl ammonium chloride or bromide, with from 0.25 to 5% dialkyl dimethyl quaternary ammonium chloride or bromide, said dialkyl groups having from about 12 to 18 carbon atoms.

4,144,327

ANTIMICROBIAL COMPOSITION COMPRISING LYTIC ENZYMES FROM PHYSARUM AND AN ANTIMYCOTIC AGENT

David A. L. Davies, and Anthony M. S. Pope, both of High Wycombe, England, assignors to G. D. Searle & Co., Chicago, Ill.

Filed Mar. 20, 1978, Ser. No. 888,276

Int. Cl.[2] A61K *37/48, 31/71*

U.S. Cl. 424—94 5 Claims

1. A method for treating fungal infections in animals comprising administering to an animal in need of antifungal treatment an effective amount of mycolytic enzymes extracted from Physarum.

4. A pharmaceutical composition suitable for combining with a pharmaceutically acceptable carrier comprising an effective amount of a sterile pyrogen free, lyophilised extract of lytic enzymes from Physarum in combination with an effective amount of an antimycotic agent.

4,144,328

N,N,N-TRIMETHYL DERIVATIVES OF POLYENE AMPHOTERIC ANTIBIOTICS, PROCESS OF PRODUCING SAME AND PHARMACEUTICAL COMPOSITION

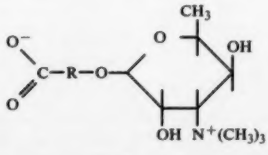
Viktor A. Vainshtein, Suzdalsky prospekt, 28, korpus 1, kv. 64; Valter O. Kulbakh, ulitsa Bukharestskaya, 86, korpus 1, kv. 85; Evgeny D. Etingov, ulitsa Zvezdnaya, 8, kv. 43; Grigory N. Naumchik, Piskarevsky prospekt, 39, kv.20, Piskarevsky prospekt, 39, kv. 20; Oleg N. Ekzemplyarov, Suvorovsky prospekt, 32b, kv. 14; Georgy A. Mikhailets, ulitsa Lanskaya, 10, kv. 100; Grigory E. Grinberg, prospekt Metallistov, 82, kv. 321, and Alla N. Egorenkova, kanal Gribcedova, 107/6, kv. 6, all of Leningrad, U.S.S.R.

Filed Feb. 28, 1977, Ser. No. 772,471

Int. Cl.[2] A61K *31/71*

U.S. Cl. 424—180 10 Claims

10. A medicinal composition comprising as an active ingredient, N,N,N-trimethyl derivatives of a fungicidal non-aromatic polyene macrolide antibiotic selected from the group consisting of amphotericyn B, mycoheptin, and nystatin, heptaenes and tetraenes of the formula:



wherein R is aglycone of a fungicidal non-aromatic polyene macrolide antibiotic without the carboxyl group, in combination with a pharmaceutically acceptable carrier.

4,144,329

ANTITUMOR ANTIBIOTICS MA 144-M_1 AND MA 144-M_2

Hamao Umezawa; Tomio Takeuchi; Hiroshi Naganawa; Masaaki, all of Ishizuka, Tokyo; Norio Shibamoto, Chigasaki; Toshikazu Oki, Kamakura, and Taiji Inui, Chigasaki, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku KenkyuKai, Tokyo, Japan

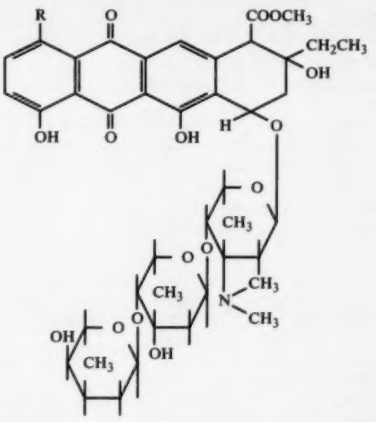
Filed Mar. 24, 1977, Ser. No. 780,730

Claims priority, application Japan, Apr. 7, 1976, 51-39688

Int. Cl.[2] A61K *31/71;* C07H *17/08*

U.S. Cl. 424—181 12 Claims

10. A pharmaceutical composition in a form suitable for parenteral administration to animals comprising an effective tumor inhibiting amount of an anthracycline glycoside selected from the group consisting of a compound of the general formula



wherein R represents a hydrogen atom or a hydroxyl group, a nontoxic acid addition salt thereof and a complex thereof with deoxyribonucleic acid, said glycoside being substantially free of substances co-produced therewith, in combination with an inert pharmaceutically acceptable carrier or diluent suitable for said administration form, said tumor being selected from the group consisting of Leukemia L1210, P388 and Sarcoma 180.

4,144,330

INSECTICIDAL S-TRIAZOLO-(1,5-A)-PYRIMIDIN-2-YL-5,7-DIMETHYL PHOSPHORIC ACID ESTERS AND AMIDES

Laurenz Gsell, Füllinsdorf, and Willy Meyer, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

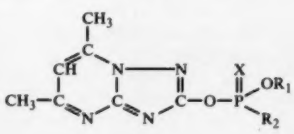
Filed Nov. 4, 1977, Ser. No. 848,556

Claims priority, application Switzerland, Nov. 10, 1976, 14185/76; Sep. 29, 1977, 11908/77

Int. Cl.[2] C07D *403/04;* A61K *31/505*

U.S. Cl. 424—200 12 Claims

1. A compound of the formula



wherein

X represents oxygen or sulphur,

R_1 represents C_1–C_6-alkyl, and

R_2 represents C_1-C_6-alkyl, C_1-C_6-alkoxy, C_1-C_6-alkylthio, C_1-C_6-alkylamino or di-C_1-C_6-alkylamino.

12. A method for combating insects and and acarides which comprises applying thereto an insecticidally or acaricidally effective amount of a compound according to claim 1.

4,144,331

SYNERGISTIC CHLORFENVINPHOS AND PYRETHROID PESTICIDAL COMPOSITION

John C. Felton, Sittingbourne, and John S. Badmin, Halfway, Minster Isle of Sheppey, both of England, assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 29, 1977, Ser. No. 820,268

Claims priority, application United Kingdom, Feb. 8, 1977, 5112/77

Int. Cl.[2] **A01N** *9/36, 9/24, 9/20*

U.S. Cl. 424—219 **8 Claims**

1. An insecticidal or tickicidal composition comprising as the essential active ingredients

(a) 2-chloro-1-(2,4-dichlorophenyl)vinyl diethyl phosphate; and

(b) a pesticidally active pyrethroid compound selected from α-cyano-3-phenoxybenzyl 2-(2,2-dichlorovinyl)-3,3-dimethylcyclopropanecarboxylate, 3-phenoxybenzyl 2-(2,2-dichlorovinyl)-3,3-dimethylcyclopropanecarboxylate or α-cyano-3-phenoxybenzyl α-isopropyl-4-chlorophenylacetate in a ratio of (a):(b) of from 1:5 to 50:1.

4,144,332

PROCESS FOR ALLEVIATING PROLIFERATIVE SKIN DISEASES

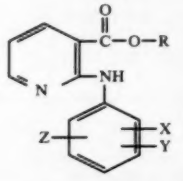
John J. Voorhees, Ann Arbor, Mich., assignor to The Regents of the University of Michigan, Ann Arbor, Mich.

Division of Ser. No. 646,633, Jan. 5, 1976, Pat. No. 4,034,087, which is a continuation-in-part of Ser. No. 425,065, Dec. 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 324,012, Jan. 16, 1973, abandoned. This application Jun. 21, 1977, Ser. No. 808,595

Int. Cl.[2] **A61K** *31/56, 31/455*

U.S. Cl. 424—240 **2 Claims**

1. A process for alleviating proliferative skin diseases which comprises administering to the afflicted human or animal a composition containing as its active component at least one of the compounds selected from the group represented by the formula:



where R is hydrogen or $—CH_2CHOHCH_2OH$, X is lower alkyl of from 1 to 8 carbon atoms, lower alkoxy of from 1 to 8 carbon atoms, chloro, bromo or NO_2, Y is chloro, bromo, NO_2 or lower alkyl of from 1 to 8 carbon atoms, Z is hydrogen, halogen, CF_3 or lower alkyl of from 1 to 8 carbon atoms inclusive;

said compound being in association with a pharmaceutical carrier wherein said active component is present in an amount in the range of about 0.1 to about 15% w/v which is effective to alleviate proliferative skin disease.

2. A process in accordance with claim 1 wherein said active component was administered in conjunction with a permissive dosage of a glucocorticoid.

4,144,333

MONOCYCLIC BETA-LACTAMS WITH ANTIBACTERIAL ACTIVITY

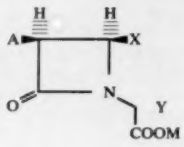
Ralph F. Hall, Cranbury, N.J., and William F. Huffman, Malvern, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Nov. 15, 1976, Ser. No. 742,149

Int. Cl.[2] **C07D** *205/08, 407/06, 409/06, 413/06*

U.S. Cl. 424—244 **28 Claims**

1. A compound of the formula



wherein

A is acylamino, amino or protected amino other than acylamino as defined herein;

acyl is

Y′—CH_2CO, or Z—$S(O)_nCH_2CO$;

X′ is thienyl, furyl, cyclohexyl, cyclohexenyl, cyclohexadienyl, phenyl or phenyl substituted with one or two substituents selected from the group consisting of lower alkyl, lower alkoxy, hydroxy, hydroxymethyl, halo, nitro, amino, aminomethyl, mercapto, lower alkylthio, trifluoromethyl, ureido, formamido, and carboxymethylamino;

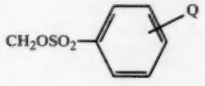
A′ is amino, hydroxy, formyloxy, carboxy, sulfo or (when the α-hydrogen is absent) methoxyimino or oximino;

Y′ is cyano, azido, phenyl, phenoxy, 2-aminomethylphenyl, or a heterocyclic ring selected from the group consisting of thienyl, furyl, thiazolyl, isothiazolyl, oxadiazoyl, thiadiazolyl, triazolyl, tetrazolyl, sydnone, pyridyl, and pyrimindyl; each heterocyclic ring being unsubstituted or substituted with one or two substituents selected from lower alkyl, halo, hydroxy, nitro, amino, lower alkoxy or phenyl;

Z is phenyl, pyridyl, lower alkyl, trifluoromethyl, trifluoroethyl or cyanomethyl;

n is 0, 1 or 2;

X is CH_2-halogen,



or CH_2OSO_2R;

R is lower alkyl;

Q is hydrogen, lower alkyl, or halo;

Y is

or hydroxy

E is hydrogen, lower alkyl, trifluoromethyl or phenyl unsubstituted or substituted with one or two substituents selected from the group consisting of lower alkoxy, lower alkyl, halo and nitro; and

M is hydrogen, a carboxylic acid protective ester group or a pharmaceutically acceptable cation.

4,144,334

NOVEL α-HYDROXY STEROIDS

Karl Petzoldt, and Walter Elger, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

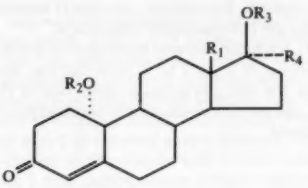
Continuation of Ser. No. 623,542, Oct. 17, 1975, Pat. No. 4,029,779. This application Feb. 10, 1977, Ser. No. 767,420

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1974, 2450106; Sep. 1, 1975, 2539261

Int. Cl.[2] A61K *31/56;* C07J *7/00*

U.S. Cl. 424—243 7 Claims

1. A 1α-oxy steroid of the formula



wherein R_1 is methyl; R_2 and R_3 each are hydrogen atoms or alkanoyl of 1–8 carbon atoms; and R_4 is a hydrogen atom or hydrocarbon of 1–4 carbon atoms.

7. A method of treatment which comprises administering to a female having an irregular menstrual cycle or menopausal symptoms or to a fertile female for the prevention of pregnancy an amount of a steroid of claim **1** effective to correct the irregular menstrual cycles, to alleviate the menopausal symptoms or to prevent pregnancy, respectively.

4,144,335

INSECTICIDAL 2-SUBSTITUTED-IMINO-3-ALKYL-5-DIALKOXYPHOSPHINOTHIOYLOXY-6H-1,3,4-THIADIAZINE

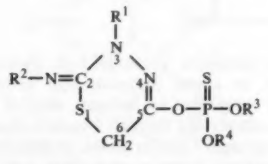
Laroy H. Edwards, Napa, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 24, 1978, Ser. No. 889,757

Int. Cl.[2] C07D *285/16;* A01N *9/36*

U.S. Cl. 424—246 12 Claims

1. A compound of the formula



wherein R^1 is alkyl of 1 to 6 carbon atoms, R^2 is alkyl of 1 to 6 carbon atoms, alkenyl of 3 to 6 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl or phenyl substituted with 1 to 2 substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, fluoro, chloro, bromo, iodo, nitro, trifluoromethyl, trichloromethyl, tribromomethyl, and alkoxy of 1 to 4 carbon atoms, R^3 is alkyl of 1 to 6 carbon atoms and R^4 is alkyl of 1 to 6 carbon atoms.

5. A method of killing insects which comprises contacting said insects or their habitats with an insecticidally effective amount of the compound defined in claim **1**.

4,144,336

2-BENZOPYRANONE DERIVATIVES, PROCESS FOR THEIR PRODUCTION, THEIR USE AS MEDICAMENTS, MORE ESPECIALLY AS CORONARY DILATORS

Karl-Heinz Boltze, Bensberg-Kippekausen; Peter-Rudolf Seidel, Porz-Wahnheide; Haireddin Jacobi, Leichlingen, and Helmut Schwarz, Bensberg-Frankenforst, all of Fed. Rep. of Germany, assignors to Troponwerke Dinklage & Co., Cologne, Fed. Rep. of Germany

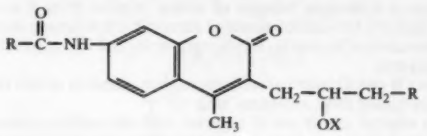
Filed Jul. 8, 1976, Ser. No. 703,340

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1975, 2530405; Oct. 2, 1975, 2543945

Int. Cl.[2] C07D *407/14*

U.S. Cl. 424—248.54 25 Claims

1. A 2-benzopyranone compound of the formula



wherein

X is a 3,4,5-trimethoxybenzoyl group or a 3,4,5-trimethoxycinnamoyl group; and one

R is morpholino or substituted morpholino wherein the substituents are selected from alkyl, hydroxyalkyl, 3,4,5-trimethoxybenzoyloxy-alkyl or 3,4,5-trimethoxycinnamoyloxy-alkyl, wherein said alkyl contains up to 3 carbon atoms; and the other

R is morpholino or substituted morpholino wherein the substituents are selected from alkyl, hydroalkyl, 3,4,5-trimethoxybenzoyloxy-alkyl or 3,4,5-trimethoxycinnamoyloxy-alkyl, wherein said alkyl contains up to 3 carbon atoms; or is selected from alkylamino and dialkylamino wherein a carbon atom may be replaced by an oxygen atom; hydroxyalkyl amino or hydroxydialkylamino; 3,4,5-trimethoxybenzoyloxy-alkylamino, 3,4,5-trimethoxybenzoyloxy-dialkylamino; 3,4,5-trimethoxycinnamoyloxy-alkylamino; 3,4,5-trimethoxycinnamoyloxy-dialkylamino; wherein the said alkylamino and dialkylamino contain up to 6 carbon atoms in each alkyl moiety; substituted amino wherein the substituent is selected from one or two of alkenyl of 2 to 4 carbon atoms, aralkyl of up to 10 carbon atoms and cycloalkyl of 4 to 7 carbon atoms, or a salt of each compound with a physiologically acceptable acid.

4,144,337

1,4-SUBSTITUTED PIPERAZINYL DERIVATIVES USEFUL AS PSYCHOSTIMULANTS

Jean-Michel Bastian, Therwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Feb. 14, 1977, Ser. No. 768,513

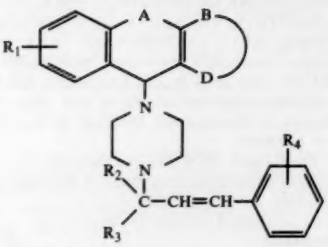
Claims priority, application Switzerland, Feb. 17, 1976, 1903/76; Feb. 17, 1976, 1905/76; Feb. 17, 1976, 1906/76; Feb. 17, 1976, 1907/76

Int. Cl.[2] A01N *9/00*

U.S. Cl. 424—250 14 Claims

1. A compound of formula I,

I



wherein each of R_1 and R_4, which may be the same or different, is hydrogen, halogen of atomic number from 9 to 35, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms,

either each of R_2 and R_3 is hydrogen or R_2 and R_3 together are oxygen,

either B and D together with the carbon atoms to which they are bound form a benzene ring, or

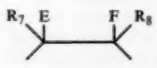
B is sulphur and B and D together with the carbon atoms to which they are bound form a thiophene ring which may be substituted in the position α- to the sulphur atom with halogen of atomic number from 9 to 35 or alkyl of 1 to 4 carbon atoms, and

when B and D together with the caron atoms to which they are bound form a benzene ring,

A is oxygen, sulphur, $-CH_2-O-$ or $-CH_2-S-$ in either orientation, or

when B is sulphur and B and D together with the carbon atoms to which they are bound form a substituted or unsubstituted thiophene ring,

A is a group of formula



wherein each of R_7 and R_8, which may be the same or different, is hydrogen or alkyl of 1 to 4 carbon atoms and either each of E and F is hydrogen or E and F together form a bond,

or a pharmaceutically acceptable acid addition salt thereof.

3. A method of stimulating the central nervous system in animals, which comprises administering to an animal in need of such treatment a therapeutically effective amount of a compound of claim 1.

4,144,338

N-PYRIMIDINYL-N-DIALKYLAMINOALKYL UREAS

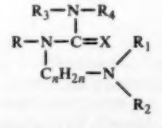
William A. Bolhofer, Frederick, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 17, 1977, Ser. No. 769,475

Int. Cl.[2] A61K *31/505;* **C07D** *239/42*

U.S. Cl. 424—251 **9 Claims**

1. A compound having the formula:



wherein R is pyrimidinyl which may be optionally substituted with from 1 to 3 of loweralkyl, halo, hydroxy, amino, mono or di-loweralkylamino, loweralkoxy or phenylloweralkoxy;

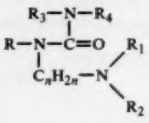
R_1 and R_2 are independently loweralkyl;

R_3 and R_4 are independently hydrogen or loweralkyl;

X is oxygen or sulfur; and

n is an integer of from 2 to 6, such that the direct linkage between the nitrogen atoms is either two or three carbon atoms, and the pharmaceutically acceptable acid addition salts thereof.

9. A composition for the inhibition of gastric acid secretion which comprises an inert carrier and a compound having the formula:



wherein R is pyrimidinyl which may be optionally substituted with from 1 to 3 of loweralkyl, halo, hydroxy, amino, mono or di-loweralkylamino, loweralkoxy, or phenyl loweralkoxy: and

R_1 and R_2, are independently loweralkyl;

R_3 and R_4 are independently hydrogen or loweralkyl; and

n is an integer of from 2 to 6, such that the direct linkage between the nitrogen atoms is either two or three carbon atoms, and the pharmaceutically acceptable acid addition salt thereof.

4,144,339

1,2-DITHIOLE PYRIMIDINES

Michel Barreau; Claude Cotrel, both of Paris, and Claude Jeanmart, Brunoy, all of France, assignors to Rhone-Poulenc Industries, Paris, France

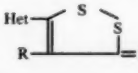
Division of Ser. No. 766,966, Feb. 9, 1977, Pat. No. 4,110,450. This application Nov. 28, 1977, Ser. No. 855,196

Claims priority, application France, Feb. 10, 1976, 76 03604; Dec. 23, 1976, 76 38901

Int. Cl.[2] A61K *31/505*

U.S. Cl. 424—251 **7 Claims**

1. A 1,2-dithiole of the formula:



wherein Het represents pyrimidin-2-yl, pyrimidin-4-yl, or pyrimidin-5-yl, or a said pyrimidin-2-yl, pyrimidin-4-yl or pyrimidin-5-yl substituted by halogen, alkyl of 1 through 4 carbon atoms, alkoxy of 1 through 4 carbon atoms, mercapto, alkylthio of 1 through 4 carbon atoms, or dialkylamino having 1 through 4 carbon atoms in each alkyl, and R represents halogen, alkyl of 1 through 4 carbon atoms, alkyl of 1 through 4 carbon atoms substituted by alkoxycarbonyl having 1 through 4 carbon atoms in the alkoxy, carboxy, alkoxycarbonyl having 1 through 4 carbon atoms in the alkoxy, carbamoyl, N-alkylcarbamoyl having 1 through 4 carbon atoms in the alkyl, or R_1—CH(OH)— in which R_1 represents hydrogen or alkyl of 1 through 3 carbon atoms.

7. A pharmaceutical anti-bilharzia composition which consists essentially of an effective amount of a 1,2-dithiole as claimed in claim 1 in association with one or more compatible and pharmaceutically acceptable diluents or adjuvants.

4,144,340
BASIC SUBSTITUTED XANTHINE DERIVATIVES

Heribert Offermanns, Hanau; Karl H. Klingler, Langen; Klaus Thiemer, Hanau, and Fritz Stroman, Offenbach, all of Fed. Rep. of Germany, assignors to Deutsche Gold und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Apr. 12, 1977, Ser. No. 786,936
Claims priority, application United Kingdom, Apr. 15, 1976, 1554/76
Int. Cl.[2] A61K *31/52;* C07D *473/08, 473/10*
U.S. Cl. 424—253 27 Claims

1. A compound of the formula

$$T—Alk—NH—CH_2—CH(OH)—CH_2O—Ar \quad (I)$$

in which T represents theophyllinyl-(7) or theobrominyl-(1), Alk is alkylene group with 2 to 5 carbon atoms or alkylene group with 2 to 5 carbon atoms substituted by hydroxy group and Ar represents an unsubstituted aromatic benzene or naphthalene or heterocyclic ring or such aromatic ring substituted by alkyl with 1 to 6 carbon atoms, alkenyl with 2 to 6 carbon atoms, alkinyl with 2 to 6 carbon atoms, hydroxy, alkanoyloxy with 2 to 6 carbon atoms, alkoxy with 1 to 6 carbon atoms, alkenoxy with 2 to 6 carbon atoms, phenyl, halogen, amino, alkanoyl with 2 to 6 carbon atoms, aminocarbonyl, ureido, alkanoylamino with 1 to 6 carbon atoms, cycloalkyl with 3 to 8 carbon atoms or a cycloalkenyl with 4 to 8 carbon atoms, the heterocyclic ring being indole ring or insoindole ring, or pharmaceutically acceptable salt thereof.

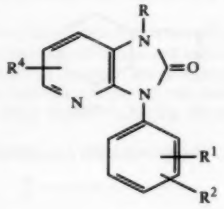
10. A method of blocking β-receptors of the adrenergic nervous system of a mammal comprising administering to the mammal an effective amount to block said β-receptor of a compound of claim 1.

4,144,341
IMIDAZO PYRIDINE-2-ONES AND PHARMACEUTICAL COMPOSITIONS AND METHODS OF TREATMENT UTILIZING SAME

Robert L. Clark, Woodbridge; Arsenio A. Pessolano, Colonia, and Tsung-Ying Shen, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

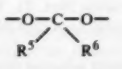
Continuation-in-part of Ser. No. 670,798, Mar. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 601,672, May 28, 1975, abandoned. This application Nov. 22, 1977, Ser. No. 853,975
Int. Cl.[2] A61K *31/435;* C07D *471/04*
U.S. Cl. 424—256 20 Claims

1. The compound of the formula:



wherein

R is hydrogen; C_{1-7} alkyl; C_{2-6} alkenyl; C_{1-7} alkyl substituted with C_{3-6} cycloalkyl, C_{1-5} alkoxy, or hydroxy, or C_{4-7} cycloalkyl; R^1 and R^2 and R^4 is hydrogen; 5- or 6- fluoro; 5- or 6- chloro; or 5- or 6- C_{1-5} alkoxy carbonylamino on adjacent carbon atoms taken together



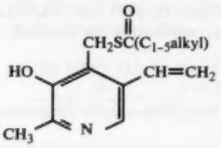
wherein R^5 and R^6 are hydrogen or lower alkyl.

4,144,342
2-METHYL-3-HYDROXY-4-ALKANOYLTHIOMETHYL-5-VINYLPYRIDINES

Tsung-Ying Shen, Westfield; Howard Jones, Holmdel, and Conrad P. Dorn, Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

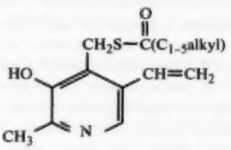
Division of Ser. No. 706,033, Jul. 16, 1976, Pat. No. 4,061,759, which is a division of Ser. No. 578,692, May 19, 1975, abandoned, which is a continuation-in-part of Ser. No. 464,011, Apr. 26, 1974, abandoned, which is a continuation-in-part of Ser. No. 368,772, Jun. 15, 1973, abandoned. This application Oct. 17, 1977, Ser. No. 842,692
Int. Cl.[2] C07D *213/62;* A61K *31/44*
U.S. Cl. 424—263 3 Claims

1. The compound of the formula:



or pharmaceutically acceptable salt thereof.

3. An anti-inflammatory composition in unit dosage form comprising a pharmaceutically acceptable inert carrier and from 5 mg. to 5 gm. of a compound of structural formula:



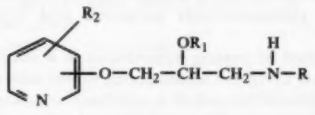
or pharmaceutically acceptable salt thereof.

4,144,343
HETEROCYCLE SUBSTITUTED (3-LOWERALKYLAMINO-2-R_1O-PROPOXY)PYRIDINES

John J. Baldwin, and Gerald S. Ponticello, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 4, 1978, Ser. No. 866,962
Int. Cl.[2] A61K *33/44;* C07D *403/02, 413/02*
U.S. Cl. 424—263 19 Claims

1. Compound having the formula



wherein

R is C_3–C_4 branched alkyl,

R_1 is H or

wherein L is selected from C_1–C_{10} alkyl, phenyl and substituted phenyl having up to two substituents independently selected from C_1–C_4 alkoxy, halo and C_1–C_4 alkyl and,

R_2 is 1-pyrrolyl, C_1–C_3 alkyl substituted-1-pyrrolyl, carbocyclicaryl substituted-1-pyrrolyl, 2-(1,3,4-oxadiazolyl),

C_1–C_3 alkyl substituted 2-(1,3,4-oxadiazolyl) or carbocyclic substituted -2-(1,3,4-oxadiazolyl) and pharmaceutically acceptable salts thereof.

12. A pharmaceutical composition useful for treating hypertension containing an effective amount of a compound of claim 1.

4,144,344

ANTIHYPERTENSIVE 1-SUBSTITUTED-4-(2-OXO-1-IMIDAZOLIDINYL) PIPERIDINES

Kurt Eichenberger, Therwil; Hans Kühnis, Basel; Franz Ostermayer, Riehen, and Herbert Schröter, Fullinsdorf, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

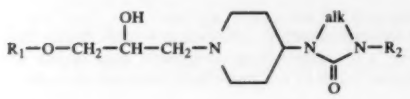
Filed Jan. 21, 1977, Ser. No. 761,510

Claims priority, application Switzerland, Jan. 21, 1976, 702/76

Int. Cl.[2] A61K *31/445;* **C07D** *401/04, 401/14*

U.S. Cl. 424—267 **10 Claims**

1. Oxygenated N-aryldiazacyclic compounds of the formula



(I)

wherein R_1, represents a phenyl or naphthyl group which is unsubstituted or substituted by a member selected from the group consisting of lower alkyl, lower alkoxy-lower alkyl, lower alkoxycarbonylamino-lower alkyl, lower alkenyl, hydroxyl, lower alkoxy, phenol-lower alkoxy, lower alkoxy-lower alkoxy, lower alkylthio-lower alkoxy, lower alkanoyl-lower alkoxy, lower alkenyloxy, lower alkinyloxy, lower alkylthio, halogen, lower alkanoyl, lower alkoxy-carbonyl, carbamoyl, N-lower alkylcarbamoyl, N,N-di-lower alkylcarbamoyl, cyano, nitro, lower alkanoylamino, lower alkoxycarbonylamino, 3-lower alkylureido and/or 3-cycloalkyl-ureido, ore represents pyridyl which is unsubstituted or substituted by a member selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio and/or halogen, R_2 represents a phenyl or naphthyl group which is unsubstituted or substituted by a member selected from the group consisting of lower alkyl, halogen-lower alkyl, lower alkoxy, halogen, lower alkanoyl, lower alkoxycarbonyl, carbamoyl, N-lower alkylcarbamoyl, N,N-di-lower alkylcarbamoyl, nitro and/or di-lower alkylamino, or represents pyridyl which is unsubstituted or substituted by a member selected from the group consisting of lower alkyl, lower alkoxy and/or halogen, and alk represents ethylene, or a pharmaceutically acceptable acid addition salt thereof.

9. A method of treating hypertension in a warm blooded animal which comprises administering to said animal a therapeutically effective amount of a compound according to claim 1, or a pharmacologically acceptable acid addition salt.

4,144,345

DIHYDROXYBENZISOXAZOLIN-3-YL-SUBSTITUTED-5-NITROIMIDAZOLES AS ANTIBACTERIALS AND ANTIPROTOZOALS

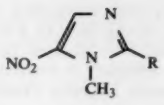
Helmut H. Mrozik, Matawan, and Peter Kulsa, Plainfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 855,861, Nov. 30, 1977, abandoned. This application Jan. 6, 1978, Ser. No. 867,552

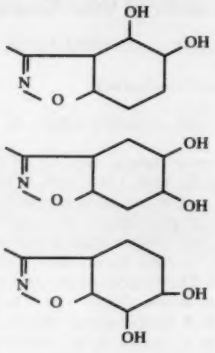
Int. Cl.[2] C07D *261/20;* **A61K** *31/42*

U.S. Cl. 424—272 **3 Claims**

1. The compound having the structural formula:

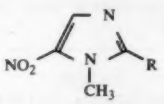


wherein R is

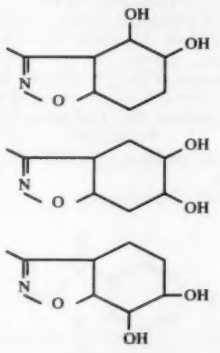


and non-toxic pharmaceutically acceptable salts thereof.

3. A composition for the treatment of trypanosomiasis comprising an inert carrier and an effective amount of a compound having the structure:



wherein R is



and the non-toxic, pharmaceutically acceptable salts thereof.

4,144,346

NOVEL 1-(1,3-DIOXOLAN-2-YLMETHYL)-1H-IMIDAZOLES

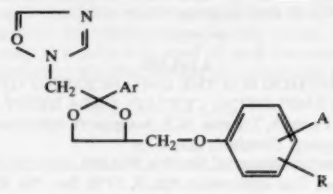
Jan Heeres, Vosselaar; Leo J. J. Backx, Arendonk, and Joseph H. Mostmans, Antwerp, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 764,263, Jan. 31, 1977, abandoned. This application Nov. 21, 1977, Ser. No. 853,728

Int. Cl.[2] A61K *31/415;* **C07D** *233/96*

U.S. Cl. 424—273 R **3 Claims**

1. A chemical compound selected from the group consisting of an azole derivative having the formula:



and the pharmaceutically acceptable acid addition salts and stereochemically isomeric forms thereof, wherein:

Q is CH;

Ar is a member selected from the group consisting of phenyl and substituted phenyl, said substituted phenyl being phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl and lower alkyloxy;

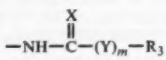
the radical A is a member selected from the group consisting of:

(a) an isothiocyanato group —N=C=S;

(b) an amino radical of the formula

wherein R_1 and R_2 are each independently selected from the group consisting of hydrogen and lower alkyl;

(c) a radical of the formula



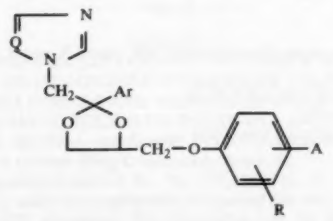
wherein X is selected from the group consisting of O and S, Y is selected from the group consisting of O and NH, m is the integer 0 or 1, and R_3 is selected from the group consisting of hydrogen, lower alkyl, mono- and dihalo(lower alkyl), phenyl and substituted phenyl, said substituted phenyl having from 1 to 2 substituents independently selected from the group consisting of halo, lower alkyl and lower alkyloxy, provided that:

(i) when said X is S, then said Y is NH and said m is 1, and

(ii) when said Y is O and said m is 1, then said R_3 is other than hydrogen; and

R is a member selected from the group consisting of hydrogen and nitro, provided that when said R is nitro, then said A is amino.

3. A composition for combatting a microorganism selected from the group consisting of fungus and bacterium comprising an inert carrier material and as an active ingredient an effective antimicrobial amount of a compound selected from the group consisting of an azole derivative having the formula:



and the pharmaceutically acceptable acid addition salts and stereochemically isomeric forms thereof, wherein:

Q is CH;

Ar is a member selected from the group consisting of phenyl and substituted phenyl, said substituted phenyl being phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl and lower alkyloxy;

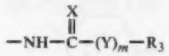
the radical A is a member selected from the group consisting of

(a) an isothiocyanato group —N=C=S;

(b) an amino radical of the formula

wherein R_1 and R_2 are each independently selected from the group consisting of hydrogen and lower alkyl;

(c) a radical of the formula



wherein X is selected from the group consisting of O and S, Y is selected from the group consisting of O and NH, m is the integer 0 or 1, and R_3 is selected from the group consisting of hydrogen, lower alkyl, mono- and dihalo(lower alkyl), phenyl and substituted phenyl, said substituted phenyl having from 1 to 2 substituents independently selected from the group consisting of halo, lower alkyl and lower alkyloxy, provided that:

(i) when said X is S, then said Y is NH and said m is 1, and

(ii) when said Y is O and said m is 1, then said R_3 is other than hydrogen; and

R is a member selected from the group consisting of hydrogen and nitro, provided that when said R is nitro, then said A is amino.

4,144,347

3-(N-IMIDAZOLYL)-2-NITROBENZOFURANS

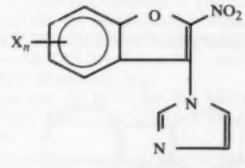
Richard M. Stern, Cottage Grove, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Filed Jun. 26, 1978, Ser. No. 919,413

Int. Cl.[2] **A61K** *31/415;* **C07D** *405/04*

U.S. Cl. 424—273 R **4 Claims**

1. A compound of the formula



wherein X is halogen, methyl, ethyl or methoxy and n is zero or one, provided that when X is methyl or methoxy n may also be two.

3. A method for arresting or inhibiting the growth of microorganisms comprising contacting said microorganisms with a compound according to claim **1** in an amount sufficient to inhibit the growth of said microorganisms.

4,144,348

MEDICAL PREPARATION FOR TREATMENT OF ALCOHOLISM

Irina N. Pyatnitskaya, 3 Peschanaya, 5, kv. 267, Moscow; Vladimir I. Ivanov, ulitsa Scherbakova, 4, kv. 37, Mytischi Moskovskoi oblasti; Nina K. Borovkova, ulitsa Guryanova, 51, kv. 188, and Nina G. Naidenova, ulitsa Kamchatskaya, 2, korpus 1, kv. 26, both of Moscow, all of U.S.S.R.

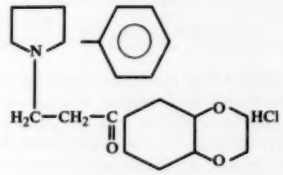
Filed Aug. 24, 1977, Ser. No. 827,344

Claims priority, application U.S.S.R., Oct. 29, 1976, 2412834 (I)

Int. Cl.[2] A61K *31/40*

U.S. Cl. 424—274 **8 Claims**

1. A composition for the treatment of alcoholism, comprising an effective amount for reducing a craving for alcohol and restoring normal body function of the active ingredient: ω-(3′-phenylpyrrolidyl-1′)-6 -propionyl benzo-1,4-dioxan hydrochloride, of the following formula:



and a pharmaceutically acceptable carrier for said active ingredient.

4,144,349

N,N-DIMETHYL-1,2,4,5,6,7-HEXAHYDROTHIOCINO[5,4-B]-INDOLE-7-PROPANAMINE-3,3-DIOXIDES AND RELATED THIOCINES

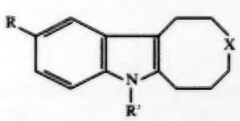
Wiaczeslaw A. Cetenko, and Glenn C. Morrison, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 23, 1977, Ser. No. 863,649

Int. Cl.[2] A61K *31/38, 31/40*; C07D *209/52*

U.S. Cl. 424—274 **22 Claims**

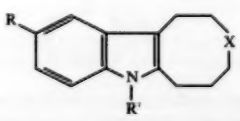
1. A compound of the formula I:



I

wherein R in hydrogen, lower alkyl, lower alkoxy or halogen; R′ is amino lower alkyl wherein the amino group is unsubstituted or substituted by mono- or di(lower alkyl); and wherein, in R and R′, the lower alkyl and lower alkoxy substituents contain 1 to 6 carbon atoms; and X is S or SO_2; and the non-toxic pharmaceutically acceptable acid-addition salts thereof.

21. A pharmaceutical composition for alleviating depression in mammals comprising an effective amount of a compound of the formula I:



I

wherein R is hydrogen, lower alkyl, lower alkoxy or halogen; R′ is amino lower alkyl wherein the amino group is unsubstituted or substituted by mono- or di(lower alkyl); and wherein, in R and R′, the lower alkyl and lower alkoxy substituents contain 1 to 6 carbon atoms; and X is S or SO_2; and the non-toxic pharmaceutically acceptable acid-addition salts thereof, together with an inert pharmaceutical carrier.

4,144,350

NOVEL METHOD FOR THE ENHANCEMENT OF WOOL GROWTH EMPLOYING CERTAIN UREA DERIVATIVES

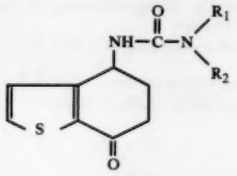
Joseph M. Pensack, Trenton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 792,274, Apr. 29, 1977, abandoned. This application Apr. 7, 1978, Ser. No. 894,225

Int. Cl.[2] A61K *31/38*

U.S. Cl. 424—275 **2 Claims**

1. A method for increasing fiber length and increasing secondary to primary wool follicle ratio in sheep comprising: parenterally administering to said sheep at birth a compound of the formula:



wherein R_1 is a member selected from the group consisting of hydrogen, C_1–C_3 alkyl, allyl, 2-propynyl and methoxy; R_2 is hydrogen or C_1–C_3 alkyl, whereby secondary to primary wool follicle ratio and wool fiber length are markedly increased, said compound being sufficient to provide a daily drug release of from 0.0005 mg to 0.2 mg of said compound per kg of animal body weight.

4,144,351

SUBSTITUTED PROPANOL-(2) DERIVATIVES AND THEIR PREPARATION AND USE AS HYPOLIPEMIC DRUGS

Helmut Grill, Vaterstetten; Rainer H. Zschocke, Munich; Josef Wagner, Grunwald; Gernot Hofrichter, Vaterstetten, all of Fed. Rep. of Germany, and P. Stefan Janiak, Basel, Switzerland, assignors to Klinge Pharma GmbH & Co., Munich, Fed. Rep. of Germany

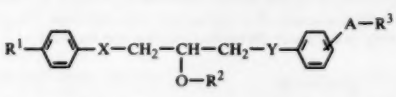
Division of Ser. No. 641,982, Dec. 18, 1975, Pat. No. 4,073,935. This application Nov. 9, 1977, Ser. No. 849,765

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1974, 2460689

Int. Cl.[2] A61K *31/335*

U.S. Cl. 424—278 **7 Claims**

1. A 1,3-disubstituted propanol-(2) derivative of the general formula:



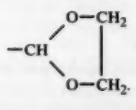
or its therapeutically acceptable salt, where X and Y stand for —O—;

R^1 = —Cl, or $-C(CH_3)_3$;

R^2 = —H;

A = a valence bond; and

R^3 =



3. A medicinal composition, for the treatment of hyperlipe-

mia comprising an antihyperlipemically effective amount of a compound according to claim 1 as the active substance together with a pharmaceutically acceptable carrier.

6. A method for treating hyperlipemia which comprises administering to a subject in need of such treatment, an antihyperlipemically effective amount of a compound according to claim 1.

4,144,352

MILBEMYCIN COMPOUNDS AS ANTHELMINTIC AGENTS

Irving Putter, Martinsville, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 19, 1977, Ser. No. 861,808
Int. Cl.[2] A61K *31/365*
U.S. Cl. 424—279 6 Claims

1. A method for the treatment of helminthic infections which comprises administering to an animal infected with helminths an effective amount of one or more of the milbemycin compounds.

4,144,353

ARTIFICIAL FISH EGGS AND METHOD OF MAKING SAME

Joe C. Zaragoza, 729 Brentwood Dr., Bakersfield, Calif. 93306

Filed Dec. 10, 1976, Ser. No. 749,395
Int. Cl.[2] A01K *85/00*
U.S. Cl. 426—1 2 Claims

1. A method of manufacturing a fish bait having physical characteristics of natural fish egg bait which comprises steeping grapes in a steeping composition of fish oil and water to impart to the grapes a fish-like odor, said steeping composition being agitated to effect mixing of the fish oil and water, the steeping composition being heated at a temperature in the approximate range of 87°–94° C. until the treated grapes rise to the surface of said steeping composition.

4,144,354

METHOD FOR PROMOTING SECRETION OF MILK OF LIVESTOCK

Naoyuki Unno, Tokyo; Mutsuyuki Yoshino, and Minoru Murata, both of Chiba, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Japan

Filed Feb. 9, 1977, Ser. No. 766,863
Claims priority, application Japan, Feb. 12, 1976, 51-13172
Int. Cl.[2] A23K *1/18*; A61K *37/48*
U.S. Cl. 426—2 5 Claims

1. A method for increasing the amount of secretion of livestock milk which comprises daily administering to a livestock, a feedstuff containing an enzyme composition having activities of 20,000–40,000 (μ/g) cellulase, 2,000–4,600 (r/mg-hr) laminarinase, 1,600–3,400 (r/mg-hr) xylanase, 10–120 (r/mg-hr) dextranase, 28–81 (%/0.3 mg) pectinase, 4–15 (μ/mg) amylase and 2–20 (μ/mg) protease which is obtained by culturing Basidiomycetes belonging to the genus Irpex, in a ratio of one or more units of cellulase activity per gram of the dry matter of feedstuff.

4,144,355

METHOD FOR SEPARATING VEGETABLE WASTE SOLIDS FROM AQUEOUS SLURRIES OF VEGETABLE WASTE MATERIALS AND METHOD OF FEEDING THE SEPARATED SOLIDS TO RUMINANT ANIMALS

Robert M. Rawlings, and Donald Procter, both of Boise, Id., assignors to Blue Wing Corporation, Boise, Id.

Continuation-in-part of Ser. No. 698,156, Jun. 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 643,999, Dec. 22, 1975, abandoned. This application Aug. 26, 1977, Ser. No. 828,153
Int. Cl.[2] A23J *1/16*; A23K *1/14*
U.S. Cl. 426—2 29 Claims

17. A process for removing vegetable waste solids from an aqueous gel of vegetable waste material having a solids content of between about 3.5 and 18% by weight and a pH of at least 11.7 comprising:

(a) admixing with said gel from about 2 to about 6% by weight of said gel of a calcium halide synerist;

(b) maintaining the admixture for an effective period of time to exude at least one-half of the water therefrom to thereby form an aggregate; and

(c) separating the exuded water from the aggregate thus formed.

4,144,356

FRIEDCAKE AND STICK MEMBER COMBINATION AND PROCESS FOR MAKING SAME

Diana G. McDaniel, 427 NW. 20th, Oklahoma City, Okla. 73103

Filed Apr. 25, 1977, Ser. No. 790,548
Int. Cl.[2] A21D *8/00*
U.S. Cl. 426—91 9 Claims

1. The process of making a friedcake food product comprising the steps of:

making a dough that is sufficiently tacky so that said dough will adhere rather tightly to a stick member when the dough is in an uncooked state;

bringing a stick member into contact with a portion of the tacky dough so that the stick member has a first stick portion surrounded by the dough portion and a second stick portion extending from the dough portion as a handle;

placing the dough portion which surrounds the first stick portion in hot deep fat so that the outside of the dough portion is quickly fried; and

terminating the frying by removing the dough portion from the deep fat while the inside of the dough portion immediately contacting the first stick portion remains essentially uncooked and therefore tacky so that the dough portion remains bonded to the stick member.

4,144,357

PREVENTING THE MAILLARD REACTION IN SYNTHETIC DIETARY COMPOSITIONS

Kasheed Mohammed, East Brunswick, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Jun. 22, 1977, Ser. No. 808,765
Int. Cl.[2] A23L *1/00, 1/187, 1/40, 2/00*
U.S. Cl. 426—96 40 Claims

1. A non-fluid composition comprising a nitrogen compound and a carbonyl compound capable of undergoing the Maillard-type browning reaction with said nitrogen compound under ambient conditions, wherein a material consisting essentially of a starch having a DE number of from 0 to about 24 physically separates at least a major proportion of said nitrogen compound from said carbonyl compound, whereby said Maillard reaction is prevented or substantially delayed during storage.

4,144,358

PREPARATION OF A CHEESE FOOD

Shiro Kudo, Ito; Keizo Ishino, and Kunihisa Akaba, both of Iida, all of Japan, assignors to Asahimatsu Koridofu Kabushiki Kaisha, Nagano, Japan

Filed Jun. 7, 1977, Ser. No. 804,435
Claims priority, application Japan, Jun. 11, 1976, 51-68409
Int. Cl.[2] A23C *19/12*
U.S. Cl. 426—582 5 Claims

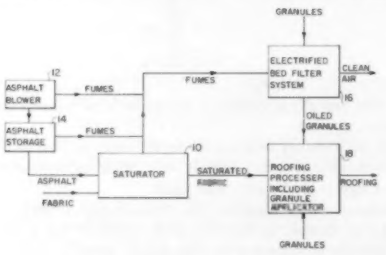
1. A process for producing food comprising mixing crushed whole soybeans, the protein of which has been thoroughly denatured by heating and the trypsin inhibitor and hemaglutanine therein have been deactivated, with natural cheese, to produce a mixture containing from 20 to 99 parts soybeans and from 1 to 60 parts natural cheese, agitating the mixture for a time period of 20–60 minutes at a temperature of 35° to 45° C., and fermenting the mixture by the enzymatic reactions of micro-organisms in the natural cheese for a period of 5 days to 2 months at a temperature of 5° to 25° C.

4,144,359

APPARATUS AND METHOD FOR CONTROLLING POLLUTANT EMISSIONS AND FOR ENHANCING THE MANUFACTURE OF ASPHALTIC ROOFING

Karim Zahedi, Brookline; Jeffery Alexander, and Peter Zieve, both of Belmont, all of Mass., assignors to EFB Inc., Cambridge, Mass.

Filed Nov. 22, 1977, Ser. No. 854,019
Int. Cl.[2] B05D *1/00;* C23C *13/04*
U.S. Cl. 427—39 21 Claims



1. For use in a system for manufacturing asphaltic roofing in which granules are applied to asphalt-treated fabric by a granule applicator, apparatus for controlling emission of particulate pollutants produced in manufacturing the roofing and comprising at least one electrified packed bed filter means including a bed of grandules of the type employed in manufacturing the roofing and electrode means for electrifying the granules of the bed, means for passing a gas stream containing the pollutants through the electrified bed, means for electrically charging the pollutants in the gas stream before the gas stream is passed through the bed, means for removing pollutant-coated granules from the bed, and means for transferring the removed granules to said applicator for application to the treated fabric.

4,144,360

METHOD FOR THE CURRENTLESS CATALYTIC PRECIPITATION OF ALUMINUM

Siegfried Birkle, Höchstadt; Richard Dötzer, Nüremberg, and Eva Rissel, Forchheim, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 1, 1977, Ser. No. 820,700
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1976, 2635798
Int. Cl.[2] C23C *3/02*
U.S. Cl. 427—123 19 Claims

1. A method for the currentless catalytic precipitation of aluminum from aprotic alane complex baths on surfaces of insulating on conductive substrate materials, said process comprising the steps of:

(a) contacting said substrate with a dilute solution of a boundary surface active catalyst to activate the surface of said substrate;

(b) thereafter intensively washing the substrate in an aprotic solvent; and

(c) immersing said substrate in an aluminizing bath comprised of an organic solution of trialkylaminalane.

4,144,361

METHODS FOR APPLYING METALLIC SILVER COATINGS

Nathan Feldstein, c/o Surface Technology Inc., Box 2027, Princeton, N.J. 08540

Filed Jul. 6, 1977, Ser. No. 813,242
Int. Cl.[2] B05D *1/02, 1/36, 1/18*
U.S. Cl. 427—162 8 Claims

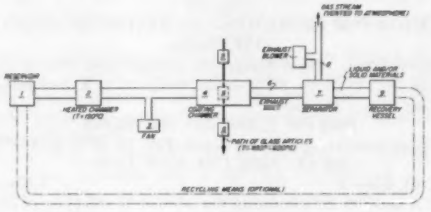
1. In a method of applying a coating of silver to a surface of a substrate utilizing a silver solution comprising reducible soluble silver ions in the presence of a reducing agent and a complexing agent, the improvement comprising concurrently applying to the surface of said substrate, a promoter and said silver solution and further wherein said promoter is a soluble compound of an element selected from the group consisting of germanium, tin and lead and mixtures thereof.

4,144,362

METHOD FOR COATING GLASS USING MONOALKYLTIN TRIHALIDES

William A. Larkin, Morristown, N.J., assignor to M&T Chemicals Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 507,074, Sep. 18, 1974, abandoned. This application Jan. 27, 1978, Ser. No. 872,766
Int. Cl.[2] B05D *3/02*
U.S. Cl. 427—226 2 Claims



1. In a method for applying a coating of stannic oxide to a glass surface by contacting the surface with a finely divided liquid tin compound while maintaining the glass surface at a temperature of between 450° and 600° C., whereupon the tin compound is pyrolyzed to form stannic oxide, the improvements which reside in (1) employing monobutyltin trichloride as the tin compound and (2) isolating and recovering the unpyrolyzed monobutyltin trichloride for subsequent reuse in accordance with said method.

4,144,363

PROCESS FOR COATING POLYOLEFIN FILMS

Riccardo Balloni, Vedano al Lambro (Milan); Pierpaolo Buzio, and Vito Galli, both of Rho, (Milan), all of Italy, assignors to Societa Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Jun. 10, 1976, Ser. No. 694,631
Claims priority, application Italy, Jun. 11, 1975, 24241 A/75
Int. Cl.[2] B05D *3/10*
U.S. Cl. 427—322 15 Claims

1. A process for coating a surface-activated polyolefin film with a vinylidene copolymer material, which comprises (a) applying to the surface of said film a solution in an organic

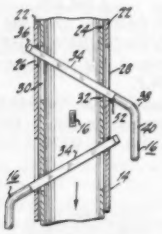
solvent, of a vinylidene copolymer material containing in copolymerized form from 35 to 60 wt. % of vinylidene chloride, from 30 to 50 wt.% of one or more alkyl esters of acrylic and/or methacrylic acid, from 1 to 10 wt.% of acrylic and/or methacrylic acids and from 1 to 10 wt.% of one or more hydroxyalkyl esters of acrylic and/or methacrylic acid, a ratio of from 0.5:1 to 5:1 being maintained in said material between the number of carboxyl groups and the number of hydroxyl groups, said material consisting of one or more copolymers each comprising moieties of said vinylidene chloride and said alkyl esters, any copolymer which does not include moieties of said hydroxyalkyl esters containing moieties of said acrylic and/or methacrylic acids, said solution containing a latent catalyst to initiate a cross-linking interaction between the carboxyl and hydroxyl groups of the vinylidene copolymer material, said latent catalyst consisting of a substance liberating acid at a temperature of at least 70° C., and said latent catalyst being the salt of an organic or inorganic acid with a tertiary amine, or an acid ester of a polybasic inorganic acid or polycarboxylic organic acid with an aliphatic alcohol and (b) heat-treating the thus coated film at a temperature of from 70° C. to 130° C., to dry said film and provoke said cross-linking.

4,144,364

CHRISTMAS TREE APPARATUS

William G. Tice, Princeton, N.J., assignor to Charles F. Byrd, Washington, D.C. and William Dailey, Sterling Heights, Mich.

Filed Mar. 3, 1978, Ser. No. 882,997
Int. Cl.[2] A47G *33/04, 33/06;* A41G *1/00*
U.S. Cl. 428—9 **5 Claims**



1. A collapsible artificial tree apparatus comprising:

a plurality of tree branches, each branch having a base end and a decorated free end;

a hollow outer tubular means having a plurality of first and second apertures therein, said second apertures being longer in one dimension than said first apertures;

a hollow inner tubular means located within said hollow outer tubular means, said hollow inner tubular means including a plurality of third and fourth apertures therein, said third apertures being longer in one dimension than said fourth apertures, said first apertures being located next to said third apertures and said second apertures being located next to said fourth apertures; and,

a stand means connected to said apparatus for supporting said apparatus,

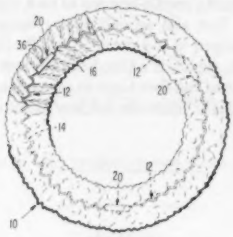
wherein the base end of each of said branches pass continuously through a second, fourth, third and first aperture respectively so that the relative movement of said hollow inner tubular means within said hollow outer tubular means causes movement of said branches from one position to another position.

4,144,365

WREATH

Monty Scudder, Bordentown-Chesterfield Rd., R.R. 2, Box 192, Trenton, N.J. 08620, and Barclay A. Townsend, Wrightstown, N.J., assignors to Monty Scudder, Trenton, N.J.

Filed Aug. 29, 1977, Ser. No. 828,451
Int. Cl.[2] A41G *1/04*
U.S. Cl. 428—10 **8 Claims**



1. In a decorative wreath of the type comprising an annular series of like wreath sections each of which includes a core element of bendable wire material, a decorative sheath on said element, and mating connecting means at the extremities of the element for connecting one end of one wreath section to the mating end of an adjacent, like section, the improvement comprising:

(1) a sleeve with openings at opposite ends adapted for connection to one end of each core element and formed with at least one aperture on a side; and

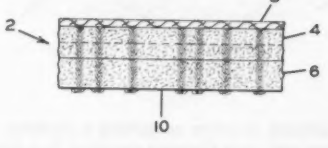
(2) a lateral projection on the other end of each core element springably tensioned to snap into said side aperture of the sleeve of an adjacent core element in response to insertion of said other end into the sleeve, said other end of the core element, and the projection on said other end, being comprised wholly of the wire material of which the core element is formed, said other end of the core element being formed with an angular leg of springy material having one end that terminates in said projection, said sleeve having opposite, transversely spaced walls in one of which said aperture is formed, the ends of the leg being engaged by the respective, opposite walls of the sleeve in the inserted position of the leg and being biased inwardly by said walls, whereby to place the leg under spring tension by the sleeve, in response to said insertion, in a direction tending to bias the projection laterally outwardly of the sleeve toward and into said aperture.

4,144,366

MULTI-COLORED PATTERN BONDED FABRIC

Robert D. Lewis, Landisville, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Sep. 6, 1977, Ser. No. 830,699
Int. Cl.[2] D04H *11/00*
U.S. Cl. 428—88 **5 Claims**



1. A needle pattern bonded fiber carpet comprising:

(a) a multi-layer web having at least three layers,

(b) the first layer being a layer of layered fibers of a certain color and denier,

(c) the second layer being at least a single layer of blended

fibers of different color and denier from each other in the second layer,

(d) the last layer being a carpet scrim layer,

(e) said three layers being positioned with said second layer being positioned over said scrim layer, and then said first layer being positioned over said second layer, with said outer surface of said first layer forming the carpet face surface, and

(f) said layers being needle-bonded to lock together the three layers, said first and second layers being needled with needles arranged in a pattern to needle the fibers of the second layer, which is a blend of different fibers, into the outer surface of the first layer to provide a pattern of first and second layer fibers on the face surface of the carpet.

4,144,367

CARPET-TREATING COMPOSITIONS

Dennis P. Landucci, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 9, 1977, Ser. No. 795,139

Int. Cl.² D06M *13/46*

U.S. Cl. 428—96 **11 Claims**

1. An antistatic agent for synthetic carpet fibers comprising alkyl sulfate quaternary salts of N,N-bis(hydroxyethyl) alkenyl amines having the formula

$$[R'N(C_2H_4OH)_2\ R'']^+R''SO_4^-$$

wherein the alkyl group R'' is methyl or ethyl and wherein a major percentage, by weight, of the salt molecules have alkenyl groups R' having at least 18 carbon atoms in the chain, said alkenyl groups having an average of at least 1.5 olefinic double bonds per chain.

4,144,368

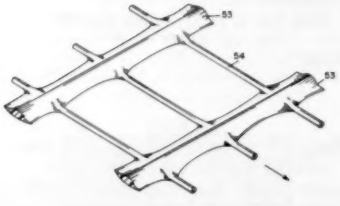
NETWORK STRUCTURES HAVING DIFFERENT CROSS-SECTIONS

Charles W. Kim, Wilmington, and Chia-Seng Liu, Newark, both of Del., assignors to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 324,030, Jan. 16, 1973, Pat. No. 3,914,365. This application Jun. 26, 1975, Ser. No. 590,643

Int. Cl.² B32B *5/12*

U.S. Cl. 428—105 **9 Claims**



1. A network structure comprising a plurality of parallel continuous solid main filaments extending in a first direction and having a substantially uniform cross-section and being substantially uniformly and continuously oriented, and a plurality of parallel solid tie filaments extending continuously across said main filaments in a second direction different from said first direction and having a cross-section thereof smaller than the cross-section of said main filaments.

4,144,369

COMPOSITE DECK PANEL

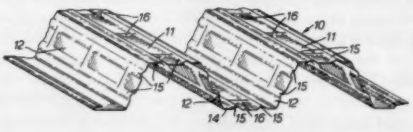
Brian J. Wass, Derby, England, assignor to Redpath Dorman Long Limited, Bedford, England

Filed Sep. 22, 1977, Ser. No. 835,794

Claims priority, application United Kingdom, Aug. 27, 1976, 35791/76

Int. Cl.² B32B *3/28, 3/30*

U.S. Cl. 428—183 **12 Claims**



1. A corrugated sheet for use as part of a composite deck comprising parallel spaced crest surfaces connected to parallel spaced soffit surfaces by upstanding connecting web surfaces that converge towards each other as they approach a common crest surface, all the crest, soffit and web surfaces being generally planar and at least the crest surfaces including upstanding, continuous crest beads of crest surface material extending parallel to the length of the crest surfaces and to each other, and said crest surfaces also including a plurality of upstanding crest cross projections of crest surface material extending between and connecting the longitudinal beads at spaced intervals along the length of the crest surfaces, whereby spaced crest shear panels bounded by crest beads and projections are provided along the crest surface.

4,144,370

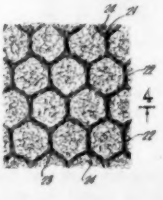
TEXTILE FABRIC AND METHOD OF MANUFACTURING THE SAME

Alan H. Boulton, Keyport, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation-in-part of Ser. No. 644,662, Dec. 29, 1975, abandoned. This application Jun. 7, 1977, Ser. No. 804,414

Int. Cl.² B32B *5/02*

U.S. Cl. 428—233 **15 Claims**

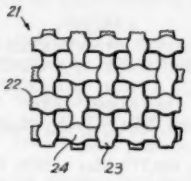


1. a double layer fabric consisting essentially of a base layer and a second layer substantially coplanar and integrally entangled with said base layer, said base layer consisting essentially of a plurality of fibers arranged in a pattern of yarn-like bundles which define a pattern of apertures in said base layer, said second layer consisting essentially of a plurality of highly entangled fiber areas, wherein said highly entangled fiber areas are arranged in a complementary pattern to the pattern of the base layer, wherein said fiber areas are disposed in the apertures of said base layer whereby the double layer fabric is nonapertured, and wherein portions of said fibers of said entangled fiber areas are wrapped and entangled with portions of fibers of said base layer.

4,144,371
FLATTENED AND BONDED FABRIC OF FOAMED VINYL PLASTISOL ON A FILAMENT CORE AND METHOD OF PREPARING SAME

James P. Okie, Wakefield, and James D. Worrall, East Greenwich, both of R.I., assignors to Engineered Yarns, Inc., Coventry, R.I.

Filed Nov. 22, 1976, Ser. No. 744,018
Int. Cl.[2] B32B 7/00
U.S. Cl. 428—255 39 Claims



1. In a method of producing a fabric of thread, said thread comprising a foamed resin on a core of yarn wherein junctions between threads are bonded together, the improvement comprising, in sequence, the steps of applying a plastisol compound containing an effective amount of a foaming agent therein as a viscous liquid to a filament yarn as a core to encapsulate said yarn, the activation temperature of said foaming agent being higher than the curing temperature of said plastisol, drawing said encapsulated yarn through a sizing die to bring the encapsulated yarn to a selected thickness, and curing said thread at least to a degree such that said thread can withstand subsequent stresses in forming into a finished fabric, said degree ranging from partial cure to full cure, at a temperature below that at which said foaming agent is activated.

4,144,372
LOW-DENSITY SPACE-FILLING SHEET MATERIAL

Warren R. Beck, Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 544,965, Jan. 29, 1975, Pat. No. 4,111,713. This application Aug. 19, 1977, Ser. No. 826,058
Int. Cl.[2] B32B 5/16
U.S. Cl. 428—283 17 Claims

1. Sheet material windable into a compact storage roll and adapted to serve as a low-density space-filling strata in a layered structure, comprising a flexible carrier web and, adhered to at least one side of the carrier web, a dense monolayer of uniformly sized discrete filler bodies that have a density of no more than about 0.75 gram/cubic centimeter and are between about 1 and 20 millimeters in average diameter.

4,144,373
MATERIALS FOR THE SEPARATION OF ORGANIC SUBSTANCES FROM SOLUTION

Donald E. Weiss, Blackburn; David R. Dixon, Keilor, and Simon M. West, Williamstown, all of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell and Kraft Foods Ltd., Port Melbourne, both of, Australia

Filed Dec. 23, 1976, Ser. No. 753,908
Claims priority, application Australia, Dec. 24, 1975, 4398/75
Int. Cl.[2] B32B 5/18
U.S. Cl. 428—306 16 Claims

1. A composite adsorbent material for adsorbing dissolved organic materials of up to a predetermined molecular weight from solution comprising adsorbent particles and magnetic particles embedded in a porous matrix of a partially or wholly cross-linked hydrophilic polymer, the degree of cross-linking being selected to provide a porosity to allow only molecules of up to said predetermined molecular weight to enter into the interstitial structure of the matrix and to exclude molecules of higher molecular weight whereby the composite adsorbent material may function selectively to adsorb dissolved organic

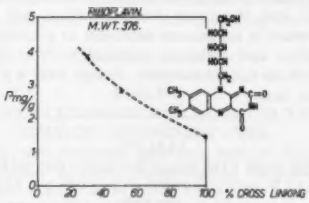


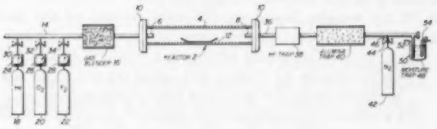
FIG. 1. AMOUNT OF RIBOFLAVIN ADSORBED PER GRAM OF ADSORBENT AFTER 3 HOURS EQUILIBRATION AS A FUNCTION OF THE DEGREE OF CROSS LINKING.

materials of up to said predetermined molecular weight from solution.

4,144,374
PERFLUORINATED FUNCTIONALIZED MATERIALS

Richard J. Lagow, Austin, Tex.; James L. Adcock, Knoxville, Tenn., and Shoji Inoue, Kodaira, Japan, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 531,931, Dec. 12, 1974, abandoned. This application Jan. 3, 1977, Ser. No. 756,451
Int. Cl.[2] B32B 27/06
U.S. Cl. 428—334 7 Claims

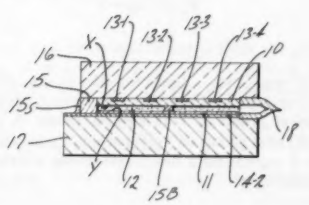


1. A conductive membrane comprising a perfluorinated polymer having pendant functional groups thereon, said pendant functional groups being selected from acid fluoride, carboxylic acid, or a mixture of both.

4,144,375
GAS DISCHARGE DEVICE CONTAINING COATED DIELECTRIC

Roger E. Ernsthausen, Luckey, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 334,047, Feb. 20, 1973, abandoned. This application Feb. 7, 1977, Ser. No. 766,280
Int. Cl.[2] H01J 61/30, 65/00
U.S. Cl. 428—336 5 Claims



1. As an article of manufacture, a dielectric material body having a structural configuration for use in a gaseous discharge display/memory device, said dielectric body having at least one electrode on one side thereof and on the opposite thereof a gas contacting surface deposit of at least one inorganic alumi-

num compound selected from the group consisting of aluminum orthoarsenate, aluminum ferrocyanide, aluminum fluosilicate, aluminum meta phosphate, aluminum orthophosphate, aluminum selenide, aluminum silicate, aluminum sulfate, aluminum sulfide, and aluminum thallium sulfate, said compound being deposited in an amount sufficient to provide operating voltages when said dielectric material body is used in said device which do not substantially change over a given period of operating time.

4,144,376
PROCESS FOR THE PRODUCTION OF MODIFIED, PARTIALLY ACETALIZED POLYVINYL ALCOHOL FILMS

Rolf Beckmann, Siegburg, and Wilhelm Knackstedt, Troisdorf, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 554,652, Mar. 3, 1975, abandoned. This application Mar. 14, 1977, Ser. No. 777,471

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1974, 2410153

Int. Cl.[2] **B32B** *17/10;* **C03C** *27/12;* **C08K** *5/54;* **C08L** *29/14*

U.S. Cl. 428—429 **22 Claims**

1. A process for adjusting the adhesive force of plasticizer-containing, partially acetalized polyvinyl alcohol film to the surfaces of inorganic glasses to certain desired pummel adhesion values required for a given application in the production of composite safety glass panes, which comprises adding to a pre-existing partially acetalized polyvinyl alcohol resin composition, which composition contains an adhesive force adjusting silane and which composition is not capable of producing a film with the desired pummel adhesion value, from 0.005 to 0.7% by weight, based on the total weight of the partially acetalized polyvinyl alcohol resin of:

(a) a silicon-functional silane or a mixture of silicon-functional silanes to reduce the adhesive force of the film prepared from the resulting resin composition; or

(b) a silicon-organofunctional silane or a mixture of silicon-organofunctional silanes to increase the adhesive force of the film prepared from the resulting resin composition; or

(c) a mixture of at least one silicon-functional silane with at least one silicon-organofunctional silane to regulate the adhesive force of the film prepared from the resulting resin composition, to obtain the desired pummel adhesion values; the silicon-functional silane in (a) or (c) being represented by the general formula:

$$Rn - Si - R'_{4-n}$$

wherein R represents alike or different, saturated, straight-chain or branched alkyl groups of 1–18 carbon atoms, R′ represents halogen, or identical or different saturated alkoxy or oxyalkoxy groups of 1–8 carbon atoms, and n is an integer from 0 to 3, and the silicon-organofunctional silane in (b) or (c) is represented by the general formula:

$$R^1_n Si - Ap - Z$$
$$\quad\quad |$$
$$\quad\quad R'_{n'}$$

wherein R^1 represents a hydrolyzable group of Cl or OR″; with R″ representing a C_{1-18} alkyl or oxyalkyl group; R′ represents an alkyl group of 1–18 carbon atoms; A represents a bivalent alkylene group of 1–10 carbon atoms which may be branched; Z represents a functional group selected from the group consisting of

$-CH=CH_2$, and $-NR'''R''''$, wherein R‴ represents H or aminoalkyl containing 2–8 carbon atoms and R⁗ is H or R‴; n is an integer from 1 to 3 and p is 1 or when Z is $-CH=CH_2$, p is O; and processing the resulting partially acetalized polyvinyl alcohol resin composition into a film with the desired pummel adhesion value; wherein said partially acetalized polyvinyl alcohol resin contains 10 to 25% by weight of vinyl alcohol groups, and said partially acetalized polyvinyl alcohol resin composition contains from 18 to 65 parts by weight of plasticizer per 100 parts by weight of the partially acetalized polyvinyl alcohol resin.

22. A composite safety pane comprising partially acetalized polyvinyl alcohol films produced in accordance with claim **1**, bonded to at least one glass layer.

4,144,377
THREE DIMENSIONAL SUBSTRATES COATED WITH THE REACTION PRODUCT OF AN AMINO RESIN AND AN ADDUCT OF A HIGH MOLECULAR WEIGHT SULFONIC ACID

Lawrence V. Gallacher, East Norwalk, Conn., assignor to King Industries, Inc., Norwalk, Conn.

Division of Ser. No. 683,777, May 6, 1976, Pat. No. 4,098,950, which is a division of Ser. No. 466,079, May 1, 1974, Pat. No. 3,979,478. This application Apr. 12, 1978, Ser. No. 895,654

Int. Cl.[2] **B32B** *15/08, 27/00*

U.S. Cl. 428—458 **19 Claims**

1. A three-dimensional substrate comprising a material selected from the group consisting of metal, glass, cloth, paper and plastic, the surface of which has a coating thereover comprising a reaction product of a convertible amino resin and a catalytically effective amount of a thermally-decomposable adduct of a polyalkylaromatic polysulfonic acid, having a molecular weight of at least about 500.

4,144,378
ALUMINIZED LOW ALLOY STEEL

Yong-wu Kim, Munster, Ind., assignor to Inland Steel Company, Chicago, Ill.

Filed Sep. 2, 1977, Ser. No. 830,031

Int. Cl.[2] **B32B** *15/18, 15/20*

U.S. Cl. 428—653 **9 Claims**

1. An aluminum coated low alloy steel article which has good formability and has good subsurface oxidation resistance and tensile properties when heated at an elevated temperature in an oxidizing atmosphere consisting essentially of an aluminum killed low carbon steel base having a maximum of 0.25 wt.% carbon and a maximum of metallic alloying additive of about 1% by wt., said steel having vanadium added as the essential alloy element uniformly distributed throughout the steel in an amount which combines with any uncombined carbon and nitrogen remaining in the steel and providing an excess of between about 0.1 and about 0.3 weight percent of uncombined vanadium throughout the steel, and a uniform thin hot-dip coating of metallic aluminum directly on a surface of said steel base free of oxides and nonmetallic material which interferes with the formation of said thin aluminum coating by a Sendzimir type hot-dip coating line, said low alloy steel article in the as-coated condition exhibiting good formability and when heated in an oxidizing atmosphere at an elevated temperature of about 1500° F. exhibiting good subsurface oxidation resistance and tensile properties.

4,144,379
DRAWING QUALITY HOT-DIP COATED STEEL STRIP

Ram S. Patil, Munster, and John N. Polakowski, Chesterton, both of Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Sep. 2, 1977, Ser. No. 830,032

Int. Cl.[2] **B32B** *15/18, 15/20*

U.S. Cl. 428—653 **4 Claims**

1. A drawing quality hot-dip coated steel sheet consisting essentially of a cold rolled sheet of a low carbon aluminum killed steel free of alloying elements not normally present in a low carbon aluminum killed steel and having a hot-dip coating of a metal which provides protection against corrosion, said

steel after hot-dip coating having a microstructure as in FIG. 1, and said microstructure consisting essentially of a small volume fraction of spaced islands of fine ferrite having a grain size of about 9–10 interspersed with fine pearlite and the balance of large ferrite grains having a grain size of about ASTM 7.5–8 with small grain boundary cementite.

4,144,380

CLADDINGS OF HIGH-TEMPERATURE AUSTENITIC ALLOYS FOR USE IN GAS TURBINE BUCKETS AND VANES

Adrian M. Beltran, Ballston Lake, and William F. Schilling, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 692,512, Jun. 3, 1976, abandoned. This application Aug. 10, 1977, Ser. No. 823,229
Int. Cl.[2] B32B *15/18*
U.S. Cl. 428—679 **11 Claims**

1. A cladding for use on gas turbine buckets or gas turbine vanes subject to high-temperature corrosive atmospheres, said cladding consisting essentially of, by weight, 25–35 percent chromium, 15–35 percent nickel, 0–15 percent cobalt, 3–6 percent aluminum, 0.1–1.5 percent yttrium, balance iron, said cladding having a crystal structure at least 66 percent face centered cubic and a nickel plus cobalt content of at least 30 percent by weight.

4,144,381

ELECTROCHEMICAL PH CONTROL

Nicholas Fatica, Cleveland, Ohio, assignor to Energy Development Associates, Madison Hgts., Mich.

Filed Sep. 20, 1977, Ser. No. 834,960
Int. Cl.[2] H01M *10/36*
U.S. Cl. 429—50 **9 Claims**

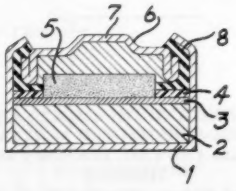
1. A method for controlling electrolyte pH in an electrochemical battery system in which hydrogen is generated which comprises converting at least a portion of the generated hydrogen into a hydrogen halide which is not a principal reactant in said system, and dissolving said hydrogen halide in said electrolyte.

4,144,382

ALKALINE CELL

Kazutoshi Takeda, and Iwao Kishi, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Dec. 20, 1976, Ser. No. 752,089
Claims priority, application Japan, Dec. 19, 1975, 50/151658
Int. Cl.[2] H01M *10/48*
U.S. Cl. 429—91 **6 Claims**



1. A silver oxide alkaline battery cell comprising a cathode active material consisting essentially of a mixture of monovalent silver oxide and graphite or a compound of which the main ingredient is divalent silver oxide, an alkaline electrolyte and an anode active material consisting essentially of powdered mercury-indium-zinc alloy uniformly mixed with a binder and pressed into formed or gelled state, said cell having a first substantially constant predetermined discharge voltage until the zinc of said anode active material is substantially used up and thereafter having a second substantially constant predetermined discharge voltage which is lower than said first voltage, for a predetermined period of time, whereby the drop in voltage from said first voltage to said second voltage provides an advance indication that the cell is nearing the end of its useful life.

4,144,383

POSITIVE ELECTRODE FOR LITHIUM/METAL SULFIDE SECONDARY CELL

Louis A. Joo', and Frederick C. Miller, both of Johnson City, Tenn., assignors to Great Lakes Carbon Corporation, New York, N.Y.

Filed Oct. 3, 1977, Ser. No. 838,755
Int. Cl.[2] H01M *4/04*
U.S. Cl. 429—218 **13 Claims**

1. A method for making an improved positive electrode for use in a high temperature secondary cell consisting of a matrix of electrically conductive carbon or graphite in intimate interfacial contact with a molten salt electrolyte of alkali metal halides and a transition metal sulfide selected from the group consisting of the sulfides of iron, copper, cobalt and nickel, or a mixture of said sulfides, the improvement wherein said metal sulfide or mixture thereof is formed in situ by deposition from a solution of a soluble salt or salts of the metal or metals, subsequently evaporating the solvent to deposit the salt or salts in intimate interfacial contact with the matrix, said metal sulfide or mixture thereof then being formed by the reaction of the metal salt or salts with gaseous hydrogen sulfide.

4,144,384

CELLS HAVING CATHODES WITH VANADIUM-CHALCOGEN-CONTAINING COMPOUNDS

Allan J. Jacobson, Princeton; Russell R. Chianelli, Somerville, and M. Stanley Whittingham, Fanwood, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 3, 1978, Ser. No. 921,256
Int. Cl.[2] H01M *4/58*
U.S. Cl. 429—218 **34 Claims**

1. An electric current-producing cell, comprising:

(a) an anode having as its anode-active material one or more metals selected from the group consisting of the Periodic Table Group IA metals, Group IB metals, Group IIA metals and Group IIB metals;

(b) a cathode having as its cathode-active material one or more compounds selected from the group consisting of:

(i) those having the formula:

$$V_aZ_b \quad (1)$$

wherein Z is a chalcogen selected from the group consisting of sulfur, selenium, and sulfur-selenium mixtures, wherein a is a numerical value of about 2, and wherein b is a numerical value of about 4.5 to about 7;

(ii) those having the formula:

$$(NH_4)_xVZ_y \quad (2)$$

where Z is a chalcogen selected from the group consisting of sulfur, selenium, sulfur-selenium mixtures, wherein x is a numerical value of about 2 to about 4, and wherein y is a numercial value of about 3 to about 5; and;

(iii) those having the formula:

$$H_m(NH_4)_nVZ_y \quad (3)$$

wherein Z is a chalcogen selected from the group consisting of sulfur, selenium, and sulfur-selenium mixtures, wherein m is a numerical value of about 1 to about 3 and n is a numerical value of about 1 to about 3, subject to the proviso that the sum of m and n is a numerical value of about 2 to about 4, and wherein y is a numerical value of about 3 to about 5; and,

(c) an electrolyte which is chemically inert with respect to

said anode and said cathode and which permits the migration of ions between said anode and said cathode.

4,144,385

INTUMESCENT COATING MATERIALS

Brian Y. Downing, Kingswinford, and George D. Hamer, Birmingham, both of England, assignors to British Industrial Plastics Limited, Manchester, England

Filed Nov. 14, 1977, Ser. No. 851,380

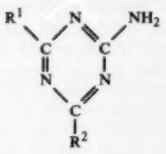
Claims priority, application United Kingdom, Nov. 27, 1976, 49567/76

Int. Cl.[2] C08J *9/00, 9/10*

U.S. Cl. 521—95 **20 Claims**

1. An intumescent composition comprising a resinous binder and an inorganic acid source, a carbon source and as blowing agent a salt of

(a) a 2-amino s-triazine of general formula



in which R^1 and R^2 are the same or different and are each selected from the group consisting of hydrogen, halogen, hydroxyl and amino groups and alkyl, substituted alkyl, alkenyl and substituted alkenyl groups containing up to 6 carbon atoms and

(b) a saturated or unsaturated polybasic carboxylic acid containing no more than 2 non-carboxyl carbon atoms per carboxyl group.

4,144,386

PROCESS FOR THE PRODUCTION OF FLEXIBLE POLYURETHANE FOAMS

Salvatore Consoli, Venezia-Mestre, and Franco Galati, Melilli (Siracusa), both of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Mar. 15, 1977, Ser. No. 777,609

Claims priority, application Italy, Mar. 17, 1976, 21288 A/76

Int. Cl.[2] C08G *18/14, 18/48, 18/08*

U.S. Cl. 521—167 **18 Claims**

1. A process for the preparation of a flexible polyurethane foam, the process comprising reacting in the presence of a foaming agent

(A) a polyhydroxyl containing polyether which includes from 75 to 90% by weight of ethylene oxide, said polyether being terminated with propylene oxide only and having been prepared by the polycondensation of a mixture of propylene oxide and ethylene oxide with a compound having at least two active hydrogen atoms said polyether having

(i) a functionality equal to or greater than 2;

(ii) an equivalent weight of between 700 and 2,200 for each hydroxyl group;

(iii) from 2 to 35 percent of primary hydroxyl groups, based on the total number of hydroxyl groups present, and

(iv) a ratio of weight percent value of ethylene oxide to the percent value of primary hydroxyl groups based on the total number of hydroxyl groups present of between 2.1 and 42.5; and

(B) a polyisocyanate which is the product of the partial polymerization of toluene diisocyanate and a polyhydroxyl containing polyether which contains propylene oxide, wherein components (A) and (B) are present in amounts such that the molar ratio of isocyanate groups to hydroxyl groups is equal to or greater than 1.

4,144,387

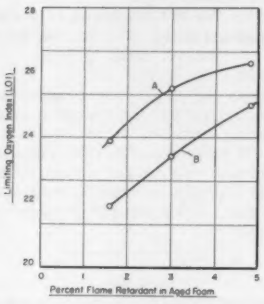
PHOSPHONATE FLAME RETARDANT MIXTURE AND RESINOUS FOAMS CONTAINING SAME

James J. Anderson, Richmond, Va.; Vasco G. Camacho, Charleston, S.C.; Robert E. Kinney, Lawrenceville, N.J., and Francis M. Seger, Factoryville, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

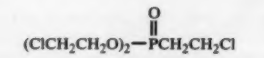
Continuation-in-part of Ser. No. 639,750, Dec. 11, 1975, abandoned, which is a continuation-in-part of Ser. No. 483,174, Jun. 26, 1974, abandoned. This application Feb. 2, 1978, Ser. No. 874,460

Int. Cl.[2] C09K *3/28;* C08K *5/53;* C08G *18/14*

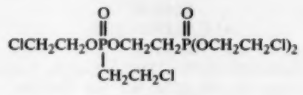
U.S. Cl. 521—174 **14 Claims**



1. A flame retardant mixture containing between about one weight percent and about 75 weight percent of a monomer compound having the structure:



and between about 99 weight percent and about 25 weight percent of a high boiling phosphonate comprising predominantly a compound having the structure:



5. A polymer composition containing a flame retardant amount of the flame retardant mixture of claim 1.

4,144,388

FILM-FORMING AND THERMOCURABLE VINYL ALCOHOL-SUBSTITUTED ACRYLAMIDE COPOLYMERS AND PROCESS FOR PRODUCTION THEREOF

Tadao Yatsu, and Isaburo Higashi, both of Iwakuni, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Dec. 12, 1977, Ser. No. 859,470

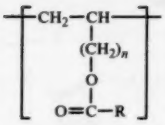
Claims priority, application Japan, Dec. 14, 1976, 51-149354; Sep. 13, 1977, 52-109417

Int. Cl.[2] C08F *8/32*

U.S. Cl. 526—9 **2 Claims**

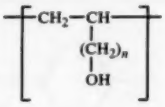
1. A process for producing a film-forming and thermocurable unsaturated alcohol-substituted acrylamide copolymer consisting essentially of

(1) 0 to 20 mole% of a unit of the formula



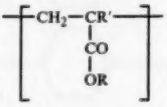
wherein R represents a group selected from the class consisting of alkyl groups with 1 to 7 carbon atoms and aryl groups with 6 to 7 carbon atoms, and *n* is 0 or 1,

(2) 30 to 70 mole% of a unit of the formula



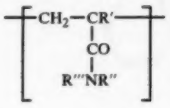
wherein *n* is as defined above,

(3) 0 to 20 mole% of a unit of the formula



wherein R′ represents a hydrogen atom or a lower alkyl group, and R is as defined above, and

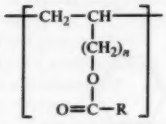
(4) 30 to 70 mole% of a unit of the formula



wherein R′ is as defined above, R″ represents a group selected from the class consisting of alkyl groups with 1 to 18 carbon atoms, cycloalkyl groups with 5 to 6 carbon atoms, hydroxyalkyl groups with 2 to 4 carbon atoms and aryl groups with 6 to 7 carbon atoms, and R‴ represents a group selected from the class consisting of a hydrogen atom and the group R″,

the amount of each unit being based on the total amount in moles of units (1) to (4); which comprises reacting a copolymer consisting essentially of

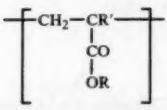
(a) unit (1) of the formula



(1)

wherein R and *n* are as defined, and

(b) unit (3) of the formula



(3)

wherein R′ and R are as defined,

with an amine selected from the group consisting of primary and secondary amines of the formula

NH_2R''

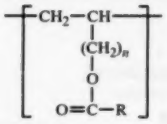
and

$NHR''R'''$

wherein R″ and R‴ are as defined above.

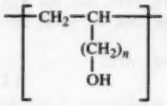
2. A process for producing a film-forming and thermocurable unsaturated alcohol-substituted acrylamide copolymer consisting essentially of

(1) 0 to 20 mole% of a unit of the formula



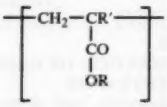
wherein R represents a group selected from the class consisting of alkyl groups with 1 to 7 carbon atoms and aryl groups with 6 to 7 carbon atoms, and *n* is 0 or 1,

(2) 30 to 70 mole% of a unit of the formula



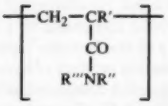
wherein *n* is as defined above,

(3) 0 to 20 mole% of a unit of the formula



wherein R′ represents a hydrogen atom or a lower alkyl group, and R is as defined above, and

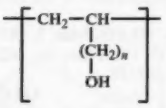
(4) 30 to 70 mole% of a unit of the formula



wherein R′ is as defined above, R″ represents a group selected from the class consisting of alkyl groups with 1 to 18 carbon atoms, cycloalkyl groups with 5 to 6 carbon atoms, hydroxyalkyl groups with 2 to 4 carbon atoms and aryl groups with 6 to 7 carbon atoms, and R‴ represents a group selected from the class consisting of a hydrogen atom and the group R″,

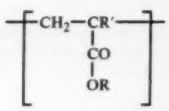
the amount of each unit being based on the total amount in moles of units (1) to (4); which comprises reacting a copolymer consisting essentially of

(a) unit (2) of the following formula



wherein *n* is as defined above, and

(b) unit (3) of the following formula



wherein R′ and R are as defined above,
with an amine selected from the group consisting of primary and secondary amines of the formula

NH_2R''

and

NHR″R‴

wherein R″ and R‴ are as defined above.

4,144,389
CURABLE COMPOSITIONS CONTAINING CHLOROPRENE RUBBER

Masao Onizawa, Kunitachi, Japan, assignor to Sanyo Trading Co., Ltd., Tokyo, Japan

Division of Ser. No. 734,808, Oct. 22, 1976, Pat. No. 4,067,859, which is a division of Ser. No. 653,630, Jan. 29, 1976, Pat. No. 4,018,750. This application Aug. 10, 1977, Ser. No. 823,448
Claims priority, application Japan, Jan. 24, 1975, 50-76807; Feb. 3, 1975, 50-13329
Int. Cl.[2] C08F *8/42, 8/32*
U.S. Cl. 526—47.8 **4 Claims**

1. A vulcanizable composition comprising a chloroprene rubber, at least one amino acid selected from the group consisting of tyrosine, threonine, tryptophan, proline and hydroxyproline, and at least one metal oxide selected from the group consisting of magnesium oxide and zinc oxide.

4,144,390
PROCESS FOR THE POLYMERIZATION OF OLEFINS AND CATALYSTS THEREFOR

Jean-Louis Derroitte, and André Delbouille, both of Brussels, Belgium, assignors to Solvay & Cie, Brussels, Belgium

Filed Oct. 1, 1971, Ser. No. 185,881
Claims priority, application Luxembourg, Oct. 6, 1970, 61816
Int. Cl.[2] C08F *4/02, 10/02*
U.S. Cl. 526—125 **4 Claims**

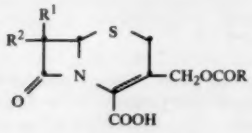
1. Catalysts for the polymerization and copolymerization of α-olefins comprising an organometallic compound of a metal of Groups Ia, IIa, IIb, IIIa, and IVa of the Periodic Table and a solid cocatalyst comprising the reaction product of hydrogen chloride, with a solid organic oxygenated compound selected from a phenate or an alkoxide having A C_1–C_{20} carbon atom radical attached, via oxygen, to magnesium, and reacting the reaction product with a compound of a transition metal selected from halides, oxyhalides, alkoxyhalides, oxyalkoxyhalides and alkoxides of titanium, the hydrogen chloride and organic oxygenated compound being in proportions required to result in a solid reaction product thereof having an atomic ratio of chlorine/magnesium from greater than 1.5 to 1.97 and contacted at a temperature of from −15° to +50° C.

4,144,391
CEPHALOSPORIN DISPLACEMENT REACTION

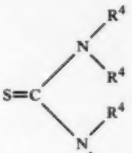
Lowell D. Hatfield, Bargersville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

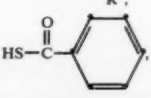
Continuation-in-part of Ser. No. 775,018, Mar. 7, 1977, abandoned. This application Dec. 27, 1977, Ser. No. 862,871
Int. Cl.[2] C07D *501/36*
U.S. Cl. 544—21 **115 Claims**

1. A method for the displacement of the 3-acyloxy of a 3-(acyloxymethyl)cephalosporin by a sulfur nucleophile, which comprises reacting, in an organic solvent and under essentially anhydrous conditions, a 3-(acyloxymethyl)cephalosporin compound of the formula

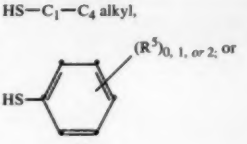


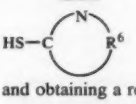
with a sulfur nucleophile of the formula:


(1)

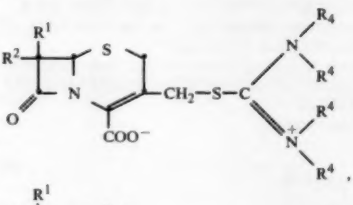

(2)

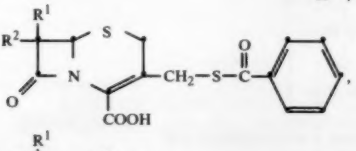
$HS-C_1-C_4$ alkyl, (3)

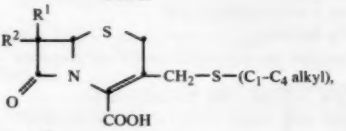

(4)

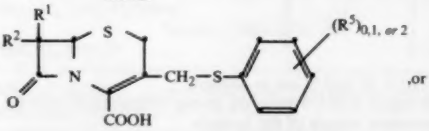

(5)

and obtaining a reaction product of the formula








,or

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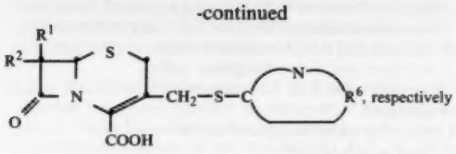
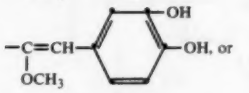


R is
(1) C_1–C_3 alkyl,
(2) C_4–C_6 cycloalkyl,
(3) amino,
(4) mono- or di(C_1–C_3 alkyl)amino,

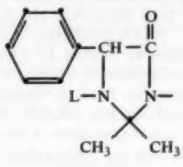
(5)

(6)

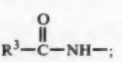


(7)

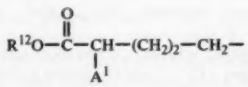
R^1 is hydrogen or methoxy;
R^2 is phthalimido, succinimido, a radical of the formula



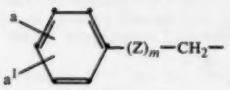
wherein L is hydrogen or nitroso, or a radical of the formula



R^3 is
(1) hydrogen,
(2) C_1–C_6 alkyl,
(3) —CH_2—(C_1–C_3 chloroalkyl),
(4) —CH_2—(C_1–C_3 fluoroalkyl),
(5) C_1–C_4 cyanoalkyl,
(6) C_1–C_4 hydroxyalkyl,
(7) p-nitrobenzyloxy,
(8) tert-butoxy,
(9) (2,2,2-trichloroethoxy),
(10) a protected 4-amino-4-carboxybutyl radical of the formula

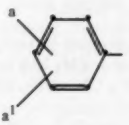


wherein A^1 is a protected amino group and R^{12} is hydrogen or C_1–C_4 alkyl;
(11) 4-oxo-4-carboxybutyl;
(12) 3-carboxypropyl;
(13) a radical of the formula

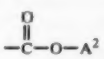


in which each of a and a^1 is independently hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, halogen, hydroxy, or A^1CH_2— wherein A^1 is, as above, protected amino; Z is O or S; and m is 0 or 1;
(14) a radical of the formula

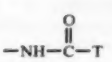
wherein P is
(a) 2-thienyl,
(b) 3-thienyl, or
(c) a phenyl group of the formula



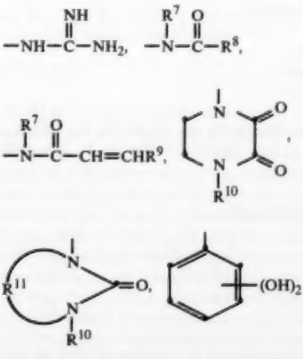
in which a and a^1 are as defined above; and wherein Q is
(a) hydroxy,
(b) formyloxy,
(c) acetoxy,
(d) carboxy of the formula



wherein A^2 is diphenylmethyl, p-nitrobenzyl, benzyl, 2,2,2-trichloroethyl, tert-butyl, or p-methoxybenzyl;
(e) (alkali metal oxysulfonyl),
(f) a protected amino group,
(g) an acylated amino group of the formula



wherein T represents amino,



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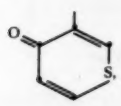
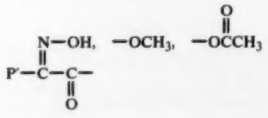


wherein R^7 is hydrogen or C_1–C_3 alkyl; R^8 is phenyl, halophenyl, furyl, monomethylamino, dimethylamino, monoethylamino, diethylamino, methylethylamino, propylamino, dipropylamino, diisopropylamino, phenylamino, or diphenylamino; R^9 is hydrogen, C_1–C_4 alkyl, or phenyl; R^{10} is hydrogen, C_1–C_3 alkyl, or methylsulfonyl; and R^{11} is ethylene, trimethylene, or vinylene;

(15) a radical of the formula



wherein P′ is P as defined above, protected 2-amino-4-thiazolyl, or 2-furyl;

(16) a radical of the formula $V\text{-}S(O)_n\text{—}CH_2\text{—}$ wherein V represents $-CF_3$ or $-CH_2\text{-}X$ wherein X represents hydrogen, methyl, CF_3, CN, or N_3, and n represents 0, 1, or 2; or

(17) a radical of the formula Y—CH_2— in which Y is

(a) 2-thienyl,
(b) 3-thienyl,
(c) 2-furyl,
(d) 2-oxazolyl,
(e) 2-thiazolyl,
(f) 1-tetrazolyl,
(g) 1-benzotriazolyl,
(h) 2-oxazolylthio,
(i) 2-thiazolylthio,
(j) 1,2,3-triazol-5-ylthio,
(k) 1,3,4-triazol-2-ylthio,
(l) 1,3,4-thiadiazol-2-ylthio,
(m) protected 5-amino-1,3,4-thiadiazol-2-ylthio,
(n) 5-methyl-1,3,4-thiadiazol-2-ylthio,
(o) 1,2,4-thiadiazol-5-ylthio,
(p) 3-methyl-1,2,4-thiadiazol-5-ylthio,
(q) 1,2,5-thiadiazol-3-ylthio,
(r) 1,3,4-oxadiazol-2-ylthio,
(s) 5-methyl-1,3,4-oxadiazol-2-ylthio,
(t) 1-methyl-5-tetrazolylthio,
(u) pyridylthio,
(v) 4-cyano-1,2,3-triazol-1-yl,
(w) 3-cyano-1,2,4-triazol-1-yl, or
(x) protected 2-amino-4-thiazolyl;

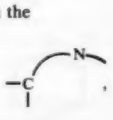
each R^4 is independently

(1) hydrogen,
(2) C_1–C_4 alkyl,
(3) C_2–C_3 alkenyl,
(4) cyclohexyl, or
(5) phenyl;

each R^5 is independently C_1–C_4 alkyl, C_1–C_4 alkoxy, halo, hydroxy, nitro, cyano, methanesulfonamido, or trifluoromethyl; and

R^6 is

(1) a unit which with the

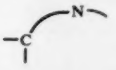


comprises an unsubstituted or substituted, five or six-membered, heteroaromatic ring having a total of from 1 to 4 hetero atoms selected from the following combinations:

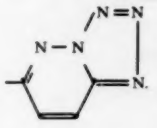
1 nitrogen and 0 or 1 oxygen or sulfur,
2 nitrogens and 0 or 1 oxygen or sulfur,
3 nitrogens, and 0 or 1 oxygen, or
4 nitrogens,

all other ring atoms being carbon; or

(2) a unit which with the



comprises 2-benzimidazolyl, 2-benzothiazolyl, 2-benzoxazolyl, or a radical of the formula



4,144,392

CEPHALOSPORINS HAVING AT POSITION-7 A CARBOXY SUBSTITUTED α-ETHERIFIED HYDROXYIMINO-ARYLACETAMIDO GROUP AND AT POSITION-3 THE RESIDUE OF A SULPHUR NUCLEOPHILE

Janice Bradshaw, Harrow; Martin C. Cook, Liverpool, and Gordon I. Gregory, Chalfont St. Peter, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

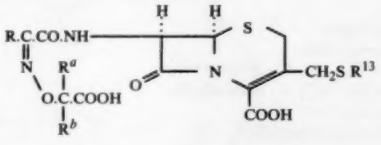
Continuation-in-part of Ser. No. 668,529, Mar. 19, 1976, Pat. No. 4,103,084, which is a continuation of Ser. No. 533,451, Dec. 16, 1974, abandoned. This application Jun. 15, 1976, Ser. No. 696,438

Claims priority, application United Kingdom, Dec. 21, 1973, 59517/73

Int. Cl.[2] **C07D** *501/56;* **A61K** *31/545*

U.S. Cl. 544—27 **8 Claims**

1. A compound selected from the group consisting of a cephalosporin antibiotic of the formula:



wherein

R is thienyl or furyl;

R^a is hydrogen, methyl, ethyl, propyl, isopropyl, butyl, allyl, cyclohexyl or phenyl;

R^b is hydrogen, carboxy, C_2–C_5 alkoxycarbonyl, methyl, ethyl, propyl, isopropyl, butyl, allyl, cyclohexyl or phenyl; or

R^a and R^b together with the carbon atom to which they are attached form a C_{3-7} cycloalkylidene group; and

R^{13} is C_1–C_6 alkyl, C_3–C_7 cycloalkyl, phenyl C_1–C_6 alkyl, phenyl, naphthyl, thiadiazolyl, diazolyl, triazolyl, tetrazolyl, thiazolyl, thiatriazolyl, oxazolyl, oxadiazolyl, pyridyl, pyrimidyl, benzimidazolyl, benzoxazolyl, benzothiazolyl, triazolopyridyl or purinyl;

and a physiologically acceptable salt, ester, or 1-oxide thereof.

4,144,393
3-ACETOXYMETHYL CEPHALOSPORINS HAVING AT POSITION-7 A CARBOXY SUBSTITUTED α-ETHERIFIED HYDROXYIMINOARYLACETAMIDO GROUP

Janice Bradshaw, Harrow; Martin C. Cook, Liverpool, and Gordon I. Gregory, Chalfont St. Peter, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Continuation-in-part of Ser. No. 533,451, Dec. 16, 1974, abandoned. This application Mar. 18, 1976, Ser. No. 668,245

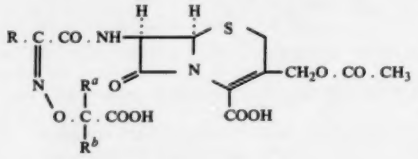
Claims priority, application United Kingdom, Dec. 21, 1973, 59517/73

The portion of the term of this patent subsequent to Dec. 20, 1994, has been disclaimed.

Int. Cl.[2] **C07D** *501/34;* **A61K** *31/545*

U.S. Cl. 544—28 **8 Claims**

1. A compound selected from the group consisting of a cephalosporin antibiotic of the formula:



wherein

R is thienyl or furyl;

R^a is methyl, ethyl, propyl, isopropyl, butyl, allyl, cyclohexyl or phenyl;

R^b is hydrogen, carboxy, C_2–C_5 alkoxycarbonyl, methyl, ethyl, propyl, isopropyl, butyl, allyl, cyclohexyl or phenyl;

or R^a and R^b together with the carbon atom to which they are attached from a C_{3-7} cycloalkylidene, group;

and a physiologically acceptable salt or 1-oxide thereof.

4,144,394
PHOSPHOROAMIDATES

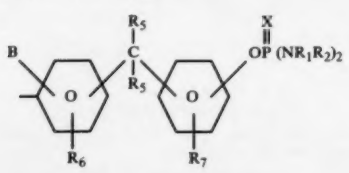
Albert W. Morgan, Collinsville, Ill.; Ignatius Schumacher, and William Vanderlinde, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 459,257, Apr. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 276,810, Jul. 31, 1972, abandoned. This application Dec. 19, 1977, Ser. No. 862,080

Int. Cl.[2] **C07D** *295/16*

U.S. Cl. 544—84 **6 Claims**

1. A compound of the formula



wherein

X represents oxygen or sulfur;

B represents hydrogen or $—OP(X)(NR_1R_2)_2$;

NR_1R_2 represents a 5 or 6 member heterocyclic ring which additionally may contain oxygen, sulfur or nitrogen;

R_5 repesents hydrogen, an alkyl group of 1 to 20 arbon atoms, an aryl group, an alkylaryl group or halogen; and R_6 and R_7 represents hydrogen, an alkyl group of 1 to 10 carbon atoms, an aryl group or an alkylaryl group; and the acid and alkaline and ammonium salts thereof.

4,144,395
PROCESS FOR THE PREPARATION OF POLYETHER-ESTER POLYOLS

John R. Murphy, and Louis C. Pizzini, both of Trenton, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 5, 1977, Ser. No. 857,072

Int. Cl.[2] **C07C** *69/60*

U.S. Cl. 560—200 **6 Claims**

1. In a process for the preparation of polyetherester polyols by the reaction of a polyether polyol and a polycarboxylic acid anhydride to form a half acid-ester followed by the reaction of the half acid-ester with an alkylene oxide to obtain a product having an acid number of 5 mg KOH/gm or less the improvement which comprises carrying out the reaction between the alkylene oxide and the half acid-ester in the presence of from 50–100 ppm based on the weight of the starting polyether polyol of a trialkylamine having from 2 to 4 carbon atoms in the alkyl chain.

4,144,396
PROCESS FOR PRODUCING ALKYLENE GLYCOL ESTERS

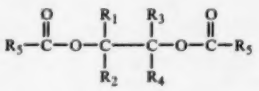
Takeshi Okano, Machida; Naoto Wada, Komae, and Yoshimitsu Kobayashi, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Jun. 27, 1977, Ser. No. 810,626

Int. Cl.[2] **C07C** *67/05*

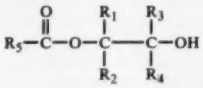
U.S. Cl. 560—246 **10 Claims**

1. In a process for the production of alkylene glycol esters having the formula (I):



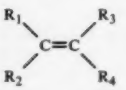
(I)

wherein R_1, R_2, R_3, and R_4 are selected from the group consisting of hydrogen, C_1–C_{20} alkyl and C_1–C_{20} aryl; and R_5 is C_1–C_{20} alkyl or C_1–C_{20} aryl, and/or the formula (II):



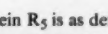
(II)

wherein R_1, R_2, R_3, R_4 and R_5 are as defined herein above, which comprises reacting an olefin having the formula (III):



(III)

wherein R_1, R_2, R_3, and R_4 are as defined herein above, a carboxylic acid having the formula (IV):



(IV)

wherein R_5 is as defined herein above, and molecular oxygen, the improvement consisting essentially of: reacting said olefin and said carboxylic acid in the presence of a catalyst consisting essentially of a bromine-containing compound selected from the group consisting of hydrobromic acid, hypobromous acid, bromous acid, bromic acid, alkali metal, alkaline earth metal and copper salts of said acids, organic bromine compounds which liberate bromide ion upon solvolysis and bromine, and a nitrogen oxide selected from the group consisting of NO,NO_2, N_2O_3, N_2O_4, N_2O_5, nitric acid, nitrous acid and alkali metal, alkaline earth metal, aluminum and copper salts of said acids, alkyl nitrites, alkylcarbonyl nitrites and alkyl nitrates.

4,144,397

PREPARATION OF 2-ARYL-PROPIONIC ACIDS BY DIRECT COUPLING UTILIZING A MIXED MAGNESIUM HALIDE COMPLEX

Gary J. Matthews, and Robert A. Arnold, both of Boulder, Colo., assignors to Syntex Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 769,070, Feb. 16, 1977, abandoned. This application Dec. 19, 1977, Ser. No. 863,290

Int. Cl.[2] C07C *51/00*

U.S. Cl. 562—466 **11 Claims**

1. A process for the preparation of a 2-arylpropionic acid wherein aryl is selected from the group consisting of 6-methoxy-2-naphthyl, 4-alkylphenyl and 4'-fluoro-4-biphenyl which process comprises:

(a) contacting a solution of an aryl magnesium bromide with a solution of a complex, $CH_3CH(Br)COOMgX$, wherein X is chloro or bromo, in an aprotic organic solvent medium comprising an ether, and

(b) quenching the reaction mixture from (a) with acid.

4,144,398

PROCESS FOR THE PREPARATION OF ACROLEIN AND ACRYLIC ACID

Jawad H. Murib, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Jul. 7, 1977, Ser. No. 813,643

The portion of the term of this patent subsequent to Sep. 27, 1994, has been disclaimed.

Int. Cl.[2] C07C *45/00, 51/32*

U.S. Cl. 562—524 **7 Claims**

1. A vapor phase process for the preparation of acrolein, acrylic acid and mixtures thereof or methacrolein, methacrylic acid and mixtures thereof which comprises reacting allyl acetate or methallyl acetate and oxygen in the presence oof a heterogeneous catalyst composition consisting essentially of a catalytically effective amount of palladium metal or palladium metal and a metal selected from the group consisting of copper, silver and gold and mixtures thereof.

4,144,399

CATALYZED DECOMPOSITION OF PEROXIDE INTERMEDIATES RESULTING FROM THE AUTOXIDATION OF ACROLEIN OR METHACROLEIN

Ming N. Sheng, and Jar-lin Kao, both of Cherry Hill, N.J., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 23, 1977, Ser. No. 780,564

Int. Cl.[2] C07C *51/00, 57/04*

U.S. Cl. 562—598 **13 Claims**

1. A two stage process for the preparation of acrylic acid or methacrylic acid which comprises the steps of:

oxidizing acrolein or methacrolein with oxygen or an oxygen-containing gas in the liquid phase to produce a reaction product oxidate solution containing the corresponding peracrylic acid and acrolein monoperacrylate or permethacrylic acid and methacrolein monopermethacrylate;

subjecting the oxidate solution to a temperature in the range of from about ambient to about 100° C., in the presence of from about 0.0001 to about 1.0 percent by weight of the reaction product oxidate solution of a ruthenium of osmium catalyst selected from the group consisting of ruthenium metal, ruthenium formate, ruthenium acetate, ruthenium propionate, ruthenium butyrate, ruthenium halides, ruthenium oxides, ruthenium carbonyls, osmium metal, osmium dichloride, osmium trichloride, osmium tetrachloride, osmium hexafluoride, osmium tetrafluoride, osmium iodide, osmium disulfide, osmium tetrasulfide, osmium sulfite, osmium dioxide, osmium tetroxide, osmium sesquioxide, osmium carbonyls, potassium hexacyanoosmate (IV), hexamine osmium (III) chloride, trispyridine osmium (III) bromide, potassium nitridopentachloroosmate (VI), tris(diethylphenylphosphine)osmium (III) chloride, dipotassium dihydroxosmate and potassium hexa(halo)osmates, or mixtures thereof, to catalytically decompose the corresponding peracrylic acid and acrolein monoperacrylate or permethacrylic acid and methacrolein monopermethacrylate to acrylic or methacrylic acid;

and recovering the acrylic or methacrylic acid produced by said oxidation and catalytic decomposition.

4,144,400

PROCESS FOR THE CONTINUOUS PREPARATION OF DI-TERTIARY BUTYLCRESOLS

Helmut Fiege; Josef Haydn; Johann Renner, all of Leverkusen, and Karlfried Wedemeyer, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 6, 1976, Ser. No. 748,073

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558522

Int. Cl.[2] C07C *39/06*

U.S. Cl. 568—788 **9 Claims**

1. In a process for the continuous preparation of a di-tert.-butylcresol wherein m- or p-cresol is reacted with isobutene at elevated temperature, using H_2SO_4 as catalyst, the improvement which comprises carrying out the process with stepwise addition of isobutene employing 2–5 steps of isobutene addition, the isobutene being introduced in each step into a reaction mixture comprising substantially all of the cresol to be reacted, the total amount of isobutene being introduced stepwise such that less isobutene is introduced in a last step of the process than is introduced in a first step thereof, the process being carried out at a temperature below 80° C. and thereafter deactivating the catalyst, said process further comprising:

A. in the two stepwise addition of isobutene, between 55 and 85% of the total isobutene is introduced in the first step and between 15 and 45% of the total isobutene is introduced in the second step;

B. in the three step isobutene addition, between 35 and 80% of the total isobutene is introduced in the first step, between 4 and 32% of the total isobutene is introduced in the second step, and between 5 and 20% of the total isobutene is introduced in the third step;

C. in the four step isobutene addition, between 30 and 75% of the total isobutene is introduced in the first step, between 10 and 40% of the total isobutene is introduced in the second step, between 5 and 31% of the total isobutene is introduced in the third step, and between 2 and 20% of the total isobutene is introduced in the fourth step; and

D. in the five step isobutene addition, between 20 and 70% of the total isobutene is introduced in the first step, between 10 and 40% of the total isobutene is introduced in the second step, between 5 and 30% of the total isobutene is introduced in the third step, between 2 and 20% of the total isobutene is introduced in the fourth step, and between 1 and 15% of the total isobutene is introduced in the fifth step.

4,144,401

ALCOHOL PRODUCTION

Robert G. Wall, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 734,688, Oct. 21, 1976, abandoned. This application Apr. 21, 1978, Ser. No. 898,353

Int. Cl.[2] C07C *31/04, 31/20*

U.S. Cl. 568—840 **4 Claims**

1. A process for preparing ethylene glycol and methanol which comprises contacting formaldehyde, carbon monoxide, and hydrogen in the presence of an alcohol solvent and a catalytic amount of rhodium or a rhodium containing compound at a temperature of from about 100° C. to about 200° C. and a pressure of from about 1000 psi to about 10,000 psi wherein the molar ratio of formaldehyde to carbon monoxide to hydrogen is from about 1:20:1 to about 1:1:20.

4,144,402

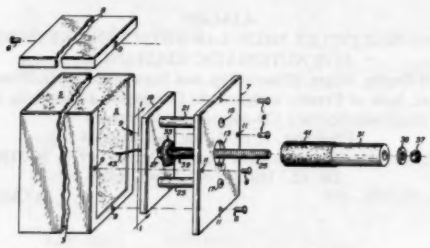
POWER SUPPLY WITH REPLACEABLE HIGH-VOLTAGE BUSHING

Herbert H. Klug, and Albert P. Staszak, both of Ft. Wayne, Ind., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Aug. 10, 1977, Ser. No. 823,507

Int. Cl.[2] H05K *5/00*

U.S. Cl. 174—52 PE **7 Claims**



1. An improved construction for a high voltage power supply comprising a container having walls defining a cavity adapted to receive electrical high voltage circuitry and an opening;

a closure member for closing said opening and containing a passage between the front and back surfaces thereof;

a support member located in said cavity, said support member being spaced from and supported by and electrically insulated from said closure member;

an elongated electrode, said electrode being coupled at one end to said support member and extending through said passage in said closure member, said electrode being of a length greater than the spacing between said closure member and said support member;

an elongated hollow cylinder of electrically insulative material of a length greater than said spacing between said closure member and said support member and lesser in length than said electrode, said cylinder being coaxially mounted on said electrode and extending through said passage approximately to said support member;

dielectric film coating means at least covering the portion of said electrode and said cylinder underlying said closure member for providing an insulative moisture barrier between the electrode and the inner walls of said cylinder and between the outer surface of said cylinder and said passage in said closure member, and

electrical potting material filling the voids within said cavity;

said film coating means being impervious to moisture and being essentially nonadhesive with said potting material so as to allow removal and reinsertion of said elongated insulator cylinder through said passage;

said electrode, cylinder and film coating means functioning together physically to prevent moisture from entering said cavity via said passage in said closure member.

4,144,403

MOUNTING ASSEMBLY FOR ELECTRIC CIRCUIT MEMBER

Sigeyuki Akita, Aichi, and Junji Kitagawa, Okazaki, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jul. 6, 1976, Ser. No. 702,629

Claims priority, application Japan, Jul. 8, 1975, 50-95442[U]; Sep. 16, 1975, 50-127231[U]

Int. Cl.[2] H05K *5/00*

U.S. Cl. 174—52 R **10 Claims**

1. An electric circuit member mounting assembly, comprising:

an electric circuit member having lead wires extending therefrom;

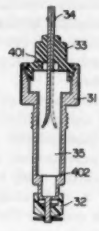
a housing having a cavity opening through one end thereof, the electric circuit member being received in said cavity and the lead wires extending out through said opening;

first surface means on the electric circuit member and the housing in the cavity thereof, where the electric circuit member and housing are in slidable engagement with one another;

a biasing means mounted on the housing;

second surface means on the electric circuit member and the biasing means;

the biasing means being displaceable between a first condition in which the biasing means is rotationally locked



relative to the housing so that if the housing were rotated, the biasing means would rotate therewith, and a second condition in which the biasing means is rotationally released relative to the housing and the frictional force exerted by the biasing means on the electric circuit member at the second surface means is greater than the frictional force exerted between the electric circuit member and the housing at the first surface means, so that if the housing were rotated, and the biasing means held rotationally stationary, the electric circuit member will remain rotationally stationary relative to the biasing means.

4,144,404

COAXIAL CABLE CONNECTOR AND METHOD OF MAKING A COAXIAL CABLE CONNECTION

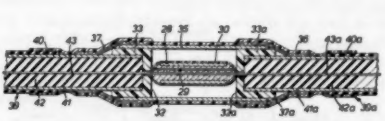
Pierre De Groef, Rue Victor Aliard, 13, 1180 Brussels, and Frank Selleslags, Lievenrouwkestraat 15, 3044 Haasrode, both of Belgium

Continuation-in-part of Ser. No. 607,249, Aug. 25, 1975, abandoned, which is a continuation of Ser. No. 452,128, Mar. 18, 1974, abandoned. This application Aug. 18, 1976, Ser. No. 715,402

Claims priority, application United Kingdom, Mar. 21, 1973, 13584/73

Int. Cl.[2] H01R *5/04, 5/08*

U.S. Cl. 174—88 C **71 Claims**



1. A connector useful for electrically connecting electrical conductors comprising:

a hollow heat-recoverable member having open ends;

a quantity of solder within the hollow heat-recoverable member; and

a deformable member comprising a metallic braid within the hollow heat-recoverable member, the deformable member comprising electrically conductive material and being infusible at the temperature to which, in use, the connector is heated to cause the heat-recoverable member to recover and the solder to fuse, the deformable member being such that, at the temperature to which it is brought

by said heating, it is deformed by the force exerted by the heat-recoverable member upon recovery.

25. A cable connector for electrically connecting coaxial cables having coaxially arranged inner and outer conductors comprising:

means for making and insulating an electrical connection between the inner conductors of the cables;

an outer electrically conductive shell having two open ends, said ends comprising a deformable and electrically conductive material having in contact therewith a quantity of solder and having thereover a heat-recoverable member such that upon heating, the solder fuses and the heat-recoverable member exerts an inward force upon the deformable electrically conductive ends of the outer shell, said ends being infusible at that temperature.

53. A method of electrically connecting two cables, each of which comprises an inner conductor and an outer conductor, which method comprises:

inserting the inner conductor of each of the cables into an inner electrically conductive member; electrically connecting the inner conductors;

inserting the outer conductors of the cables into an outer electrically conductive shell having two open ends, said ends comprising a deformable electrically conductive member having in contact therewith a quantity of solder and having thereover an outer heat-recoverable member;

and, heating the outer heat-recoverable member such that the solder melts and the heat-recoverable member exerts an inward force upon the deformable electrically conductive ends of the shell causing the ends to be deformed against the outer cable conductor and be soldered thereto.

70. A cable connection between a pair of coaxial cables comprising:

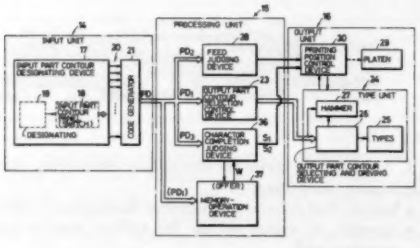
an inner tube having an aperture therein, solder thereon and a first heat-recovered member thereover, said inner tube having connected therein the inner conductors of the coaxial cable pair;

an outer electrically conductive shell over the outer conductors of the coaxial cable pair, said shell having two open ends, said ends comprised of a deformable electrically conductive material having in contact therewith a quantity of solder, having thereover a second heat-recovered member, the second heat recovered member having pressed the deformable electrically conductive ends of the outer shell into contact with the outer conductors.

4,144,405
CHARACTER WRITING SYSTEM

Shuichi Wakamatsu, 33-21, Nakahara 4-chome, Mitaka-shi, Tokyo-to, Japan

Filed Aug. 5, 1977, Ser. No. 822,230
Int. Cl.[2] G06K *15/20*; B41B *19/04*; G06F *3/02*
U.S. Cl. 178—30 **21 Claims**



1. A character writing system comprising:

input means for selectively designating one or more part contours each of which is an independent component of a non-alphabetic character and has predetermined concrete size and form or profile,

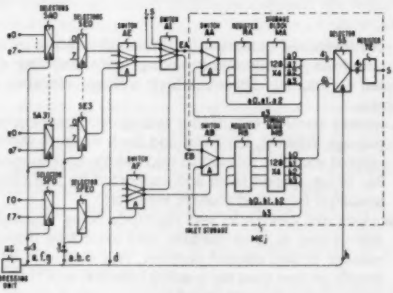
output means for sequentially writing part contours corresponding to said designated part contours in the order of designation, and

character completion control means for judging completion of writing of one character by the sequentially designated part contours and, if said one character has been completed, controlling said output means so as to provide a space between said character and the next to be written character or part thereof.

4,144,406
TIME-MULTIPLEX MODULAR SWITCHING NETWORK FOR AUTOMATIC EXCHANGE

René Deglin, Velizy Villacoublay, and Françoise Crapet, Maurepas, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Oct. 7, 1977, Ser. No. 840,444
Claims priority, application France, Oct. 19, 1976, 76 31364
Int. Cl.[2] H04J *3/00*; H04L *5/00*
U.S. Cl. 178—50 **8 Claims**



1. A time multiplex modular switching network for use in an automatic exchange serving lines carrying binary signals comprising an inlet stage composed of M inlet groups each having n inlets and inlet storage means for storing n binary signals, an outlet stage composed of M outlet groups each having n outlets and outlet storage means for storing n binary signals, and a selection switching stage divided into N switching groups each having a switching group memory for storing 2n binary signals, a selection multiplexer for providing all inlet storage means with access to each of the switching group memories, the output of each inlet storage means being connected to one inlet of said selection multiplexer in each switching group, and an access selector for providing all switching group memories with access to each outlet stage storage means, the output of each switching group memory being connected to one input of the access selector corresponding to each outlet group, whereby the overall network constitutes a full access switching system.

4,144,407
MULTIPROCESSOR SYSTEM FOR AUTOMATIC SWITCHING OF TELEGRAPHIC LINES

Giovanni Zaffignani, Ivrea, and Carlo Casalino, Chivasso (Turin), both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Oct. 27, 1977, Ser. No. 846,106
Claims priority, application Italy, Nov. 12, 1976, 69701 A/76
Int. Cl.[2] H04J *3/06*; H04Q *3/54*
U.S. Cl. 178—50 **18 Claims**

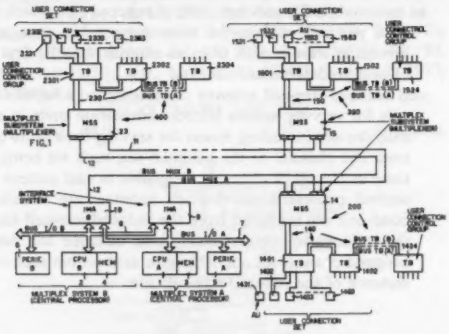
1. An automatic switching multiprocessor center for telegraphic lines operative according to the time division multiplex (TDM) technique, comprising:

a plurality of programable multiplex subsystems, each connected to a plurality of telegraphic lines connecting remote users;

a programable multiplex system;

a multiplex bus serially connecting said programable multiplex system and said plurality of programable multiplex subsystems;

said programable multiplex subsystems comprising transmission means for transmitting on said multiplex bus the



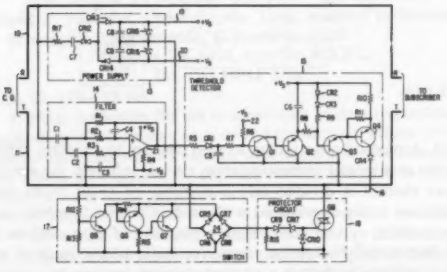
information and checking characters of the messages which are exchanged by said remote users, without the intervention of said programable multiplex system, wherein said programable multiplex system transmits the commands and the data necessary for the overall functioning of said multiprocessor center to said subsystem through said multiplex bus.

4,144,408

TELEPHONE RINGING EXTENDER

Roger E. Holtz, Indianapolis, Ind.; Bernard A. Tilson, Parsippany, and Gordon D. Woods, Denville, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 30, 1978, Ser. No. 873,476
Int. Cl.[2] H04Q 1/44
U.S. Cl. 179—16 E **8 Claims**



1. A telephone ringing extender including a ringing signal detector responsive to ringing signals generated at a telephone central office and appearing between one side of the remote end of a telephone loop and ground potential, and a switch responsive to said detector characterized in that

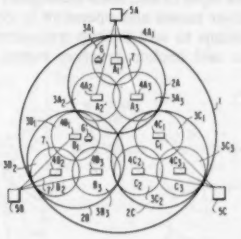
said switch, when operated by said detector, connects one side of said loop to ground potential to operate telephone ringers bridged on said loop from said ringing signals.

4,144,409

MOBILE RADIO COMMUNICATION CONTROL SYSTEM FOR PREVENTING ERRONEOUS RECEPTION OF CONTROL SIGNALS

Takanori Utano, Yokohama; Masayuki Sakamoto, Yokosuka, and Yoshikazu Takayama, Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Nippon Electric Co., Ltd., both of Tokyo, Japan

Filed Aug. 30, 1977, Ser. No. 829,111
Claims priority, application Japan, Aug. 30, 1976, 51-102606
Int. Cl.[2] H04Q 7/04
U.S. Cl. 179—2 EB **2 Claims**



1. A communication control system for a mobile radio communication network of the type having a plurality of base stations arranged in groups, each base station serving a respective small communication zone to provide wireless message channels for mobile units present in said respective small communication zone, at least one control station serving a large communication zone and connected to a group of said base stations within said large zone for receiving and transmitting clearing, cut-off and switching signals from and to said mobile units through said message channels, said message channels being provided by carrier waves of frequencies which are different for each base station within a group but common for certain base stations within different groups, characterized in that each of said mobile units includes memory means for storing a unique identifying code assigned to each of said base stations having message channels of common carrier wave frequencies, means for generating said clearing signal corresponding at least in part to said stored identifying code, means for transmitting through a message channel a carrier wave modulated by said clearing signal, at the termination of a conversation, means for receiving a carrier wave modulated by one of said cut-off and switching signals containing said identifying code, and means for comparing said stored identifying code with said received one to provide a signal for controlling said message channel, said base stations further including means for receiving and detecting said clearing signal, each said mobile unit receiving during call set-up an identifying code transmitted from and uniquely identifying the base station providing the message channel on which the call is being set-up, said mobile unit then storing the received identifying code in said memory and later using said stored, identifying code to generate said clearing signal indicating the on-hook status of said mobile unit.

4,144,410

MULTIPLEX COMMUNICATION SYSTEM

Charles E. Flickinger, Dousman, and Russell P. Schuchmann, Milwaukee, both of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Oct. 11, 1977, Ser. No. 841,219
Int. Cl.[2] H04J 3/08
U.S. Cl. 179—15 AL **28 Claims**

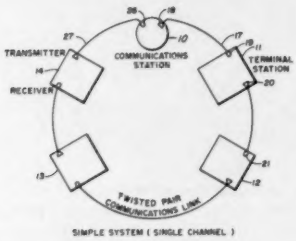
1. A reconfigurable loop structured communications system comprising:

a main loop and a backup loop parallel to each other and each capable of circulating data signals in opposite directions;

a communications unit connected to both of said loops for controlling the flow of data circulating therein;

a plurality of terminal units, each including main and backup receiver means for receiving data from said respective loops and each including main and backup transmitter means for transmitting data to said respective loops;

switching means located in each of said terminal units, said switching means operative in a first condition to communicate signals from said main receiver means to said main transmitter means and also for connecting said backup receiver means to said backup transmitter means, said switching means operative in a second condition to disconnect the input to said main transmitter means from said main receiver means and operative to connect said main receiver means to said backup transmitter means and to disconnect said backup receiver means, said switching



SIMPLE SYSTEM (SINGLE CHANNEL)

means operative in a third condition to connect said backup receiver means to said main transmitter means and operative to disconnect said main receiver means and said backup transmitter means; and

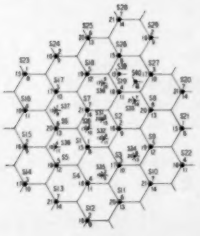
first control means located in each of said terminal units, said first control means responsive to an interruption of said data signals in a portion of said main loop between a first and a second of said terminal units and operative to cause switching of said switching means in said first terminal unit from said first to said second condition and operative to cause switching of said switching means in said second terminal unit from said first to said third condition to reconfigure said communications system into a two-loop system to permit all of said terminal units to continue to function despite the interruption of said loop between said first and said second terminal units.

4,144,411

CELLULAR RADIOTELEPHONE SYSTEM STRUCTURED FOR FLEXIBLE USE OF DIFFERENT CELL SIZES

Richard H. Frenkiel, Englishtown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 22, 1976, Ser. No. 725,429
Int. Cl.[2] H04Q 7/04
U.S. Cl. 179—2 EB **22 Claims**



1. In a cellular high capacity mobile telecommunications system wherein a fixed block of frequency channels is divided into a fixed number of sets of channels that are assigned to antenna sites, each site including means for serving mobile telecommunications units in respective cells and on a channel of the respectively assigned set, the sets being assigned in a predetermined pattern of cells of predetermined size, that pattern being at least partly reusable a sufficient number of times to cover at least part of the service area of the system,

an antenna site for serving a cell of reduced size which is at least partially within the same geographic area to be served, at least in part, from an antenna site of a first cell of said predetermined size, and

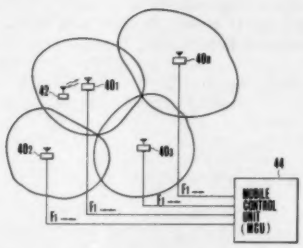
said reduced-size-cell antenna site is assigned a set of channels for serving mobile telecommunication units in such cell, the site including means for serving such units on at least one channel of the assigned set, such set being the same as the set of channels assignable in said pattern to a second predetermined-size-cell antenna site which second-cell site is spaced from the reduced-size-cell site by the reduced-size-cell channel reuse distance and has an assigned channel set not otherwise used within such reuse distance of the reduced-size-cell site.

4,144,412

METHOD OF ASSIGNING A RADIO CHANNEL TO A CALLING MOBILE BODY OF MOBILE COMMUNICATION SYSTEM AND RADIO CHANNEL ASSIGNING SYSTEM THEREFOR

Sadao Ito, Yokohama; Noriaki Yoshikawa, Yokosuka, and Mitsuru Komura, Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Jan. 17, 1977, Ser. No. 760,124
Claims priority, application Japan, Jan. 19, 1976, 51-4720
Int. Cl.[2] H04Q 7/04
U.S. Cl. 179—2 EB **17 Claims**



1. A method of assigning a radio channel to a calling mobile body in a mobile communication system wherein the service area thereof is divided into a plurality of radio zones with adjacent zones overlapped with each other, said mobile communication system comprising a plurality of base stations installed initially to define respective radio zones, each of said base stations including a control channel commonly assigned to all base stations, a plurality of speech channels and a control unit for commonly controlling said speech channels by said control channel, said method comprising the steps of comparing the intensities of signal received by respective base stations, said signal being transmitted from the mobile body, and designating as the radio channel to said calling body an idle speech channel in the base station where said signal has been received with maximum intensity.

4,144,413
ROTARY TELEPHONE DIAL

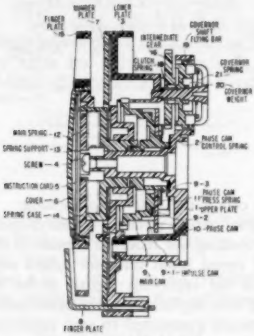
Tadashi Kodama, Sakura; Masayuki Murakami, Hoya; Tsuneji Kimeda, Yokosuka; Tadahiko Matsuoka, Kawasaki; Osamu Hara, Kodaira, and Satoru Tsukiyama, Tokyo, all of Japan, assignors to Iwasaki Tsushinki Kabushiki Kaisha and Nippon Telegraph and Telephone Public Corporation, both of, Japan

Filed Jul. 15, 1977, Ser. No. 816,219

Claims priority, application Japan, Jul. 15, 1976, 51-84221; Jul. 15, 1976, 51-84222; Jul. 15, 1976, 51-94116[U]; Jul. 15, 1976, 51-94118[U]; Apr. 7, 1977, 52-42540[U]; Apr. 7, 1977, 52-42539[U]

Int. Cl.[2] H04M *1/30, 1/34*

U.S. Cl. 179—90 R **19 Claims**



1. A rotary telephone dial comprising:

a molded base plate having at least one shaft portion extending therefrom, wherein said base plate having said shaft portion is a one piece unitary structure rotary member rotatably mounted on the shaft;

a finger wheel for rotating the rotary member, the wheel having a plurality of finger holes by means of which it may be rotated from a rest position through arcs of various lengths by the insertion therein of a finger of the dial user and the moving of the finger in an arcuate path;

a finger stop projecting into the arcuate path traversed by the finger of the dial user for stopping the finger from rotating the wheel beyond the stop; and

another base plate engaged with the free end of the shaft and supported by the shaft.

4,144,414
NETWORK SYNCHRONIZATION APPARATUS

David C. Nicholas, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 23, 1978, Ser. No. 871,576

Int. Cl.[2] H04J *3/06*

U.S. Cl. 179—15 BS **8 Claims**

1. Node apparatus for use in a network of data transmission units each of which may receive and transmit data from and to one or more other nodes each of which contains a local oscillator which may need to be adjusted toward a common system frequency comprising, in combination:

a plurality n of channel units each including;

first means for receiving digital data,

clock recovery means connected to said first means for generating a recovered clock signal indicative of the digital rate of incoming data,

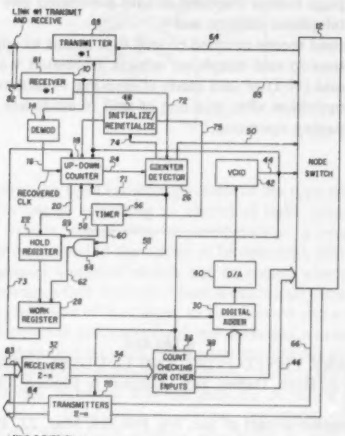
second means for receiving a local clock signal,

up/down counter means connected to said clock recovery means and said second means for receiving local clock signals therefrom, said counter means counting in one direction from an initial count for each local clock pulse received and counting in the opposite direction for each recovered clock pulse received,

count limit detection means connected to said counter for providing an output when the count exceeds predetermined limits,

register means for, upon command, outputting a digital signal indicative of the count of said counter means, and

timing means, connected to said count limit detection means and said register means, for commanding the count to be output only when a count limit is not exceeded within a prescribed time;



digital adder means connected to said register means for each of said n channel units for receiving the digital signals therefrom and for outputting a signal indicative of the sum of the signals received; and

variable frequency oscillator means connected to said digital adder means for receiving the output signal therefrom, said oscillator means providing a local clock pulse signal to said second means.

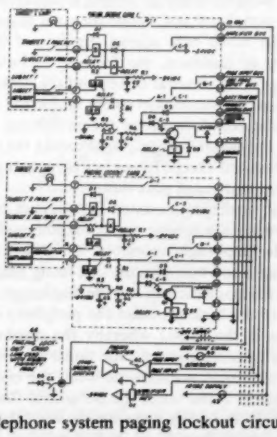
4,144,415
KEY TELEPHONE SYSTEM PAGING LOCKOUT CIRCUIT

B. Ronald Saxon, Harrisburg, Pa., assignor to International Telephone & Telegraph Corp., Nutley, N.J.

Filed Dec. 22, 1977, Ser. No. 863,491

Int. Cl.[2] H04M *1/72, 1/70*

U.S. Cl. 179—99 **15 Claims**



1. A key telephone system paging lockout circuit comprising:

N paging lockout printed circuit cards each coupled to a common busy tone generator means and an associated one of N telephone subsets, where N is equal to an integer greater than one, each of said cards including

a first means to lockout (N-1) of said cards from a common paging amplifier if any of said (N-1) of said cards attempts to initiate a paging operation a fraction of a second after one of said N cards has initiated a paging operation, said first means being actuated by at least one page button disposed in said associated one of said N telephone subsets; and

second means coupled to said first means to apply a busy tone to said telephone subsets associated with each of said (N-1) of said cards attempting to initiate a paging operation after said one of said N cards has initiated a paging operation.

4,144,416

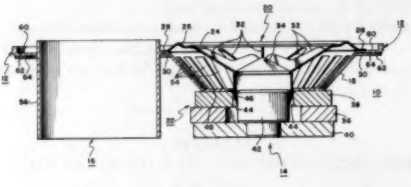
UNITARY TUNED PORT AND LOUDSPEAKER FRAME

Burton A. Babb, Dallas, Tex., assignor to Babbco, Ltd., Dallas, Tex.

Continuation-in-part of Ser. No. 669,315, Mar. 22, 1976, which is a continuation-in-part of Ser. No. 372,074, Jun. 21, 1973, Pat. No. 3,983,337. This application Mar. 21, 1977, Ser. No. 779,320

Int. Cl.[2] H04R *1/28, 9/06*

U.S. Cl. 179—115.5 **6 Claims**



1. A speaker assembly for mounting on an acoustic baffle such as the rear deck of an automobile to operate through an opening in the baffle comprising:

a unitary basket member having a frustum and an oval shaped peripheral flange having a planar face adapted to form a peripheral seal about the oval shaped opening in the baffle when held against the face of the baffle by a plurality of fasteners, the frustum including a circular opening for an acoustic driver and the basket face including at least one tuned port means within the confines of the peripheral seal formed by the peripheral flange of the basket, the basket being air tight within the confines of the peripheral seal except for a circular opening for an acoustic driver and tuned port means;

a magnetic structure mounted for support on the frustum and forming a magnetic gap for a coil; and

a movable diaphragm assembly, the diaphragm assembly including a coil member, the coil being magnetically coupled in the magnetic gap and the diaphragm member being sealed to the basket around the periphery of the circular opening in the basket whereby the diaphragm seals the circular opening and only the tuned port means provides direct air communication between the opposite sides of the acoustic baffle when the peripheral flange of the basket is held in sealing engagement with the baffle around the periphery of the oval shaped opening.

4,144,417

ECHO CANCELLING SYSTEM

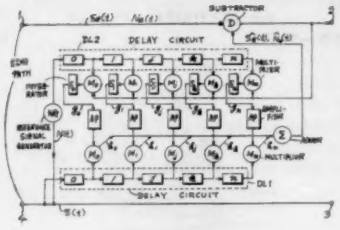
Shintaro Oshima, Musashino, and Akira Sato, Tokyo, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Continuation of Ser. No. 663,061, Mar. 2, 1976, abandoned. This application Nov. 18, 1977, Ser. No. 852,782

Claims priority, application Japan, Mar. 7, 1975, 50-27068

Int. Cl.[2] H04B *3/22*

U.S. Cl. 179—170.2 **4 Claims**



1. An echo cancelling system comprising:

received signal output terminal means connected to an echo path for sending out received signals to the echo path;

transmitted signal input terminal means connected to the echo path for receiving signals to be transmitted and receiving echo signals from the echo path;

reference means connected to said received signal output terminal means for sending out into the echo path a reference signal which has a signal level sufficiently low so as not to disturb a received signal sent out by said received signal output terminal means and which has a small mutual correlation between the reference signal and the same delayed by a very short time;

signal combining means connected to said transmitted signal input terminal means for subtracting a pseudo-echo from a true echo received from said echo path;

correlation means connected to said reference means and said signal combining means and having a plurality of output leads for obtaining correlation signals representing correlation between said reference signal and the output of said signal combining means;

amplification means including a plurality of amplifiers each having a large amplification gain and connected to a respective one of said plurality of output leads of said correlation means to receive the respective correlation signals from said correlation means for amplifying the correlation signals; and

pseudo-echo producing means connected to said received signal output terminal means, said amplification means and said signal combining means for producing said pseudo-echo of the echo path from said signals sent-out to the echo path and from said amplified signals.

4,144,418

VOLTAGE RESPONSIVE SWITCH

Roland T. Girard, Scotia; George A. Rice, Schenectady, and Arthur N. DeTommasi, Newtonville, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 27, 1977, Ser. No. 801,117

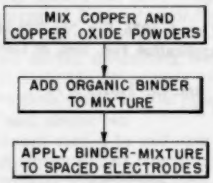
The portion of the term of this patent subsequent to Aug. 10, 1993, has been disclaimed.

Int. Cl.[2] H01H *37/64;* **H01C** *7/10;* **F21K** *5/02*

U.S. Cl. 200—2 **5 Claims**

1. A voltage responsive switch for sequentially firing a plurality of flashlamps by an irreversible change from a high electrical resistance to a low electrical resistance when activated by a voltage in excess of the threshold voltage, said switch comprising switch material interconnecting a pair of spaced electrodes, said switch material comprising a mixture of

an organic polymer binder with pure grade copper powder of approximately 99.99 percent purity and copper oxide powder in weight ratios of copper oxide to copper in the range of



approximately eight parts copper oxide and one part copper to one part copper oxide and four parts copper, said powders having particle sizes of between approximately 1 and 30 microns.

4,144,419

PUSH-BUTTON ACTUATED SLIDE SWITCH

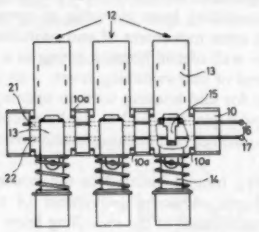
Rudolf Schadow, Berlin, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Apr. 7, 1977, Ser. No. 785,507

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1976, 2618572

Int. Cl.[2] H01H *15/00*

U.S. Cl. 200—16 R **3 Claims**



1. A pushbutton actuated slide switch comprising, in combination:

an elongated longitudinally extending insulated switch housing;

a switch plunger slidably mounted in said housing for reciprocal movement in the longitudinal direction of said housing;

a plurality of contacts fixedly mounted to said housing at the generally inner end portion thereof;

a pushbutton head mounted to the outer end of said plunger for translating said plunger within said housing;

at least one conductive bridging element mounted to the generally inner end portion of said plunger for engaging a pair of said contacts when said plunger is translated to a corresponding position;

a pair of auxiliary contacts mounted to said housing and extending from housing transversely of said longitudinal direction;

a resilient auxiliary bridging element mounted to said housing and yieldably biased toward said auxiliary contacts for engaging said auxiliary contacts; and,

means cooperating with said plunger for disengaging said auxiliary bridging element from at least one of said auxiliary contacts when said plunger is translated to a corresponding position.

4,144,420

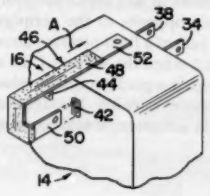
AUTOMATIC LIGHT SWITCHING SYSTEM

Raymond N. Phillips, 835 Tropical Cir., Sarasota, Fla. 33581

Filed Nov. 26, 1977, Ser. No. 855,392

Int. Cl.[2] H01H *43/02*

U.S. Cl. 200—51 R **5 Claims**



1. An automatic light switching system of the type primarily intended for use in operating an electrical light circuit, said switching system comprising, in combination: a receptacle electrically connected to the circuit to be operated, said receptacle comprising a manual switch and an outlet; wherein said outlet comprises a first receiver which is electrically connected to the energized side of the circuit to be operated and a second receiver disposed in predetermined, spaced relation to said first receiver, said second receiver being connected to the circuit to be operated, whereby making an electrical contact across said first and second receivers will energize the circuit; a plug-in automatic timer comprising an output receptacle disposed thereon and a removable adapter attachable to said output receptacle in interconnecting, conductive relation between said timer output receptacle and said outlet; wherein said adapter comprises an insulated conductor, one end of said conductor comprising a first male connector removably attachable to said output receptacle and the other end of said conductor comprising a second male connector removably attachable to said second receiver, said adaptor utilized to convert a conventional wall plug timer, which completes a circuit to an appliance at predetermined intervals to a timer which completes the circuit to be operated at predetermined intervals when said manual switch is in the off position.

4,144,421

HYDRAULIC MACHINE SHUTDOWN SENSOR ASSEMBLY

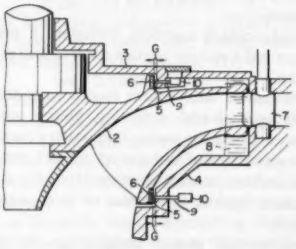
Takao Sakai, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 17, 1976, Ser. No. 751,715

Claims priority, application Japan, Dec. 19, 1975, 50-150523

Int. Cl.[2] H01H *3/16*; F01D *21/00*

U.S. Cl. 200—61.4 **6 Claims**



1. A system for shutting down a hydraulic machine having a runner mounted on a rotating shaft, at least one stationary part surrounding the runner, and a sensor assembly, comprising:

at least one sensing rod of said sensor assembly slidably supported in the direction of its longitudinal axis in said

stationary part opposite to the periphery of said runner, said sensing rod being biased toward the runner by resilient means and being slidably movable under pressure of said runner, in case of any deformation or off-center displacement of said runner, so as to sense the gap between said runner and the associated stationary part,

at least one member of said sensor assembly mounted in said stationary part opposite to the periphery of said runner and forming part of a fluid pressure circuitry which member is actuated when the stroke of the associated sensing rod has exceeded a predetermined value, and

a shutdown device operable through said fluid pressure circuitry upon actuation of said member.

4,144,422

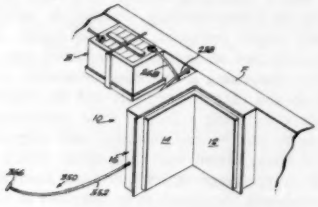
TILT ACTUATED CIRCUIT BREAKER

Orfelio Ramos, 813 NW. 27 Ct., Miami, Fla. 33125

Filed Jul. 14, 1977, Ser. No. 815,677

Int. Cl.[2] H01H *35/14*

U.S. Cl. 200—61.52 **11 Claims**



1. A tilt actuated circuit breaker comprising:

a first contact assembly including a fixed mounting means,

a first contact portion fixed to said fixed mounting means,

a second contact portion including means for slidable mounting engagement with said first contact portion and a contact surface normally extending outward a predetermined distance beyond first contact portion, and a compression spring means engaged between said fixed mounting means and said second contact portion, normally urging said second contact portion with said contact surface a predetermined distance beyond said first contact portion,

a second contact assembly including a pivotal mounting means and a unitary contact fixed to said pivotal mounting means,

a tilt-releasable latch means fixably mounted in position to latch said pivotal mounting means with said unitary contact, normally urging said unitary contact against said contact surface of said second contact portion and moving said second contact portion inwardly a predetermined distance against the forces of said compression spring means,

electric circuit means comprising electrical conductor means connecting between a battery and said first and said second contact portions, and said unitary contact and a ground connection, and

latch trip means connected to said latch means to normally maintain said electric circuit through said engaged unitary contact and said second contact portion.

4,144,423

LIMIT SWITCH, PARTICULARLY FOR THE USE AS LOCK-SWITCH FOR SAFETY BELTS

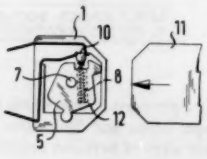
Artur Föhl, Schorndorf-Haubersbronn, Fed. Rep. of Germany, assignor to Repa Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Oct. 4, 1976, Ser. No. 729,149

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1975, 2544632

Int. Cl.[2] H01H *3/16*

U.S. Cl. 200—61.58 B **6 Claims**



1. Limit switch for installation in locks, closing apparatus and similar devices, particularly for application as lock switch for safety belts, comprising

(a) a flat housing,

(b) spaced contact elements in said housing which upon closing and opening of said contacts closes and opens a circuit,

(c) a switching lever disposed in said flat housing form-fittingly secured on one side of said switching lever in a recess of said flat housing with the other end of said switching lever free to move,

(d) a spring-loaded switch element disposed on the free end of the switching lever movable to open and close said contacts upon movement of said switching lever,

(e) the side wall of said housing acting as a stop to limit the movement of said switching lever,

(f) a cover for said housing with an opening in said cover,

(g) a tripping pin attached to said switching lever which extends through said opening in said cover of the housing, and

(h) a sliding tongue inserted in the housing to move the tripping pin, whereby movement of the tripping pin caused movement of the switching lever and said switching element disposed at the free end of the switching lever to open or close said contacts.

4,144,424

SWITCH FOR VEHICLE TRANSMISSION WITH AUTOMATIC CLUTCH

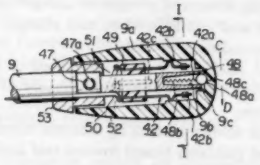
Noriyuki Takeda, Yokohama, and Tamio Kawamoto, Sagamihara, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Apr. 1, 1977, Ser. No. 783,750

Claims priority, application Japan, Apr. 5, 1976, 51-40870[U]

Int. Cl.[2] H01H *9/06*; B60K *21/00*

U.S. Cl. 200—61.88 **2 Claims**



1. An electric switch comprising:

a gear shift lever having a tubular pin rotatably and radially

extending therethrough and a stem portion projecting axially beyond said tubular pin;

a knob fixedly mounted to said tubular pin and having an axial bore into which said stem portion extends substantially coaxially thereof, said knob being tiltable relative to said stem portion in first and second opposite directions about an axis of said tubular pin;

said tubular pin having slit-defining means for permitting said knob to yieldably tilt in third and fourth opposite rockable directions within an axial plane including therein said axis of said tubular pin;

a stationary contact carried by said stem portion;

three elongate contact fingers which have their respective one ends fixedly attached to said stem portion and which have their respective opposite ends arranged around said stationary contact and carrying three movable contacts, respectively, cooperating with said stationary contact, said three elongate contact fingers having respective intermediate portions engageable with surfaces defining said axial bore so that said three movable contacts are selectively engageable with said stationary contact in response to the relative tilting movement of said knob in said first, second and third directions only; and

means for urging said knob toward a position corresponding with an open condition of said stationary contact and said three movable contacts.

4,144,425

STEERING COLUMN SWITCH MOUNTING

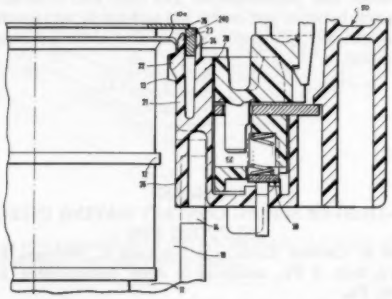
Erich Mutschler, and Adam Weber, both of Bietigheim-Bissingen, Fed. Rep. of Germany, assignors to SWF-Spezialfabrik fur Autozubehor Gustave Rau GmbH, Fed. Rep. of Germany

Filed Aug. 11, 1975, Ser. No. 603,448

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1974, 2438654

Int. Cl.[2] H01H *3/00*

U.S. Cl. 200—61.54 **4 Claims**



1. A device for securing a switch housing of a steering column switch to the end of a steering tube accomodating a steering column therein comprising, a bearing sleeve formed on the switch housing engaged over the end of the steering tube, said bearing sleeve having one end with a cut-out area spaced radially outwardly from the steering tube and extending substantially parallel to the steering tube, at least one resilient strip formed on said bearing sleeve interiorly of the cut-out area disposed adjacent the end of the steering tube, means defining a locking recess on the steering tube adjacent said resilient strip, and at least one snap-in extension projecting radially inwardly from said resilient strip and engaged into said locking recess, said snap-in extension being displaceable radially outwardly from the steering tube against the resiliency of said resilient strip and into the cut-out area of the bearing sleeve to disengage said snap-in extension from said locking recess on the steering tube.

4,144,426

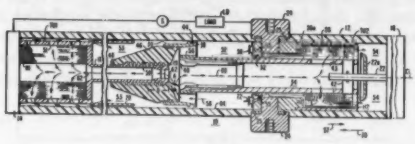
SINGLE BARREL PUFFER CIRCUIT INTERRUPTER WITH DOWNSTREAM GAS COOLERS

Peter M. Kowalik, Penn Township, Allegheny County, and Stanislaw A. Milianowicz, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 15, 1977, Ser. No. 768,939

Int. Cl.[2] H01H *33/88*

U.S. Cl. 200—148 A **12 Claims**



1. A puffer circuit interrupter, comprising:

(a) insulating tube means having first and second spaced external electrical terminal means thereon, said external terminal means communicating with the internal portion of said tube means;

(b) first electrical contact means disposed within said tube means in electrical contact with said first external terminal means;

(c) second movable hollow contact means disposed within said tube means in electrical contact with said second external terminal means, said second contact means being movable into and out of contact with said first contact means;

(d) piston means fixedly disposed upon said second contact means for moving therewith to compress puffer gas in a gas compression region, said piston means having an opening therein which joins said gas compression region and an arc region which exists between said first and said second contact contact means when separated, said puffer gas flowing through said opening into said arc region as said contact means separate to effect an arc which is struck between said first and second contact means as they separate, said gas exiting from said arc region through said second hollow contact means into a gas storage region;

(e) nozzle means fixedly disposed upon said piston means outboard of said opening therein and movably disposed upon said first contact means, said nozzle means at all times being radially interposed between said arc region and said insulating tube means to protect said insulating tube means from arc effects; and

(f) gas cooler means disposed within said gas storage region for cooling said puffer gas.

4,144,427

ANTI-REBOUND AND CONTACT KICKER MEANS FOR CIRCUIT BREAKER

Carl E. Gryctko, Zanesfield, and Andrew J. Kralik, Marysville, both of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

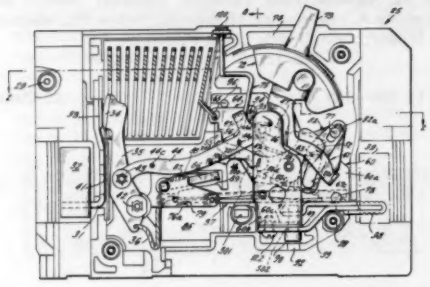
Filed Jul. 20, 1977, Ser. No. 817,355

Int. Cl.[2] H01H *3/46*

U.S. Cl. 200—153 G **13 Claims**

1. A circuit breaker including separable cooperating contact means, an operating mechanism connected to a movable portion of said contact means for opening and closing same, said mechanism including a collapsible and extendable toggle, main spring means connected to said toggle for collapsing and extending same, a latchable cradle supporting said toggle to permit closing of said contact means when said cradle is latched, said cradle when unlatched being moved by said spring means to a trip position wherein said mechanism is incapable of closing said contact means, said toggle including first and second links joined to one another and to said spring means at a knee, said first link being connected to said movable portion of said contact means, said second link being pivotally

connected to said cradle, said cradle including a first formation operatively positioned when said cradle is in said trip position



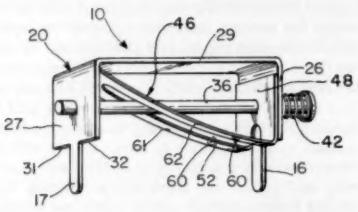
to operatively engage a second formation on said first link to block movement thereof in a direction for closing said contact means.

4,144,428

ELECTRICAL SWITCH WITH LEAF SPRING SWITCHING ELEMENT

Howard J. Voegelin, Cheshire, Conn., assignor to Veeder Industries Inc., Hartford, Conn.

Filed Dec. 16, 1976, Ser. No. 751,059
Int. Cl.[2] H01H *3/12, 13/14, 13/64*
U.S. Cl. 200—159 A **6 Claims**



1. An electrical switch comprising a support, a switch operator mounted for rectilinear reciprocable movement on the support for being shifted between first and second positions thereof for operating the switch, an elongated resilient leaf spring switching element having one end engaging the support so as to permit pivotal movement thereof relative to the support and means at the other end thereof connected to the switch operator to be shifted thereby generally toward and away from said one end as the switch operator is shifted between its said first and second positions, the leaf spring switching element being bowed outwardly an amount which increases as the switch operator is shifted from its first position to its second position and having contact means intermediate its said ends and movable along an outwardly sloping path relative to the rectilinear path of movement of the switch operator as the operator is shifted from its first to its second position.

4,144,429

MANUALLY OPERATED ELECTRICAL SWITCH

Enzo Ascoli, Lausanne, Switzerland, assignor to The Gillette Company, Boston, Mass.

Filed Dec. 12, 1977, Ser. No. 859,614
Int. Cl.[2] H01H *1/36*
U.S. Cl. 200—164 R **11 Claims**

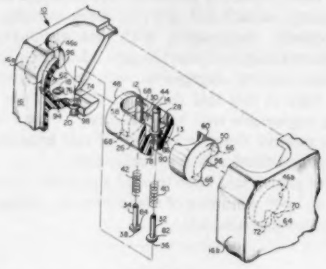
1. A manually operated switch comprising:

a housing having an aperture and a protuberance in said aperture;

an electrical insulating member assembled in said housing to pivotally move about a predetermined axis, said insulating member having an end with a concavity and a bearing surface formed thereon, said insulating member end being assembled in said aperture in said housing with said protuberance fitting within said concavity so that said bearing surface touches said protuberance when said electrical insulating member is pivotally moved over a predetermined angle, thereby limiting said pivotal movement of said insulating member;

first electrical conductor means for conducting electrical energy, said first electrical conductor means having a socket at one end and being fixedlly attached to said housing;

second electrical conductor means for conducting electrical energy, said second electrical conductor means being



fixedly attached to said insulating member with a longitudinal axis substantially normal to said predetermined axis;

contact means for conducting electrical energy, said contact means being telescopically coupled to said second electrical conductor; and

bias means coupled to said second electrical conductor and said contact means for directing a contact end against an opposing surface, said contact end being detachably received in said socket and in a notch in said housing when said second electrical conductor means is pivotally moved about said predetermined axis over said predetermined angle between said socket and said notch, said notch being electrically insulated from said first electrical conductor means.

4,144,430

CANTILEVER SPRING CONTACT HAVING INTEGRAL SUPPORT PIN

Daniel R. Coldren, Enola, and Benjamin C. Williams, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 10, 1978, Ser. No. 885,144
Int. Cl.[2] H01H *1/24, 1/26, 1/28*
U.S. Cl. 200—245 **10 Claims**

1. A spring contact which is intended for insertion into a circuit board, said spring contact comprising:

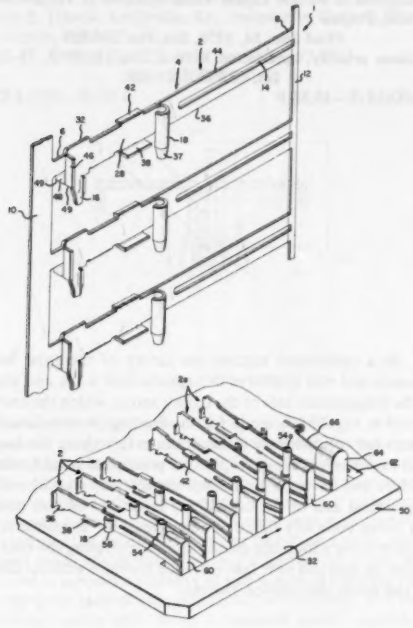
an elongated spring blade having a mounting end and a free end,

an integral mounting plate portion disposed beside and extending parallel to, said blade, said mounting plate portion extending from said mounting end partially along said blade towards said free end, said mounting plate portion and said blade being connected to each other by a connecting fold which is integral with adjacent edge portions of said mounting plate portion and said blade,

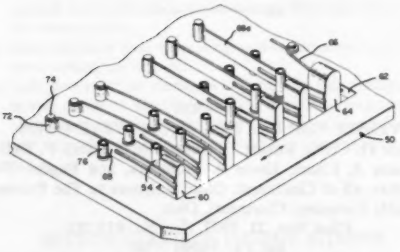
an integral mounting pin means extending laterally from said spring contact at said mounting end, and

a blade support pin integral with, and extending laterally from said mounting plate only, said support pin being spaced from said mounting pin whereby,

upon insertion of said mounting pin and said support pin into spaced apart holes in a circuit board, said spring blade will



PRIOR ART



extend across one surface of said circuit board in a plane which extends normally of said circuit board.

4,144,431

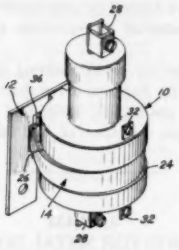
MEANS OF SECURING MECURY DISPLACEMENT SWITCHES TO A MOUNTING BRACKET

George H. Elenbaas, P.O. Box K, Edwardsburg, Mich. 49112

Filed May 19, 1977, Ser. No. 798,361
Int. Cl.[2] H01H *29/04*
U.S. Cl. 200—295 **5 Claims**

1. In combination a mercury displacement switch and mounting bracket, said combination wherein said mercury displacement switch includes first and second neck parts and an enlarged body part located between said neck parts, each neck part terminating in a load contact for connection to a power circuit, said switch body part having a generally cylindrical outer surface, said body part surface having an eccentric offset center portion forming a groove in said surface extending about approximately one-half of the circumference of the body part and a raised land extending about the other remaining approximate one-half of the circumference of the body part, said bracket including spaced protrusions, the spacing between said protrusions exceeding the width of said switch land, said switch fitted upon said bracket with the land thereof seating between said protrusions, and strap means for securing said switch to said bracket, said strap means extending about said switch body part within said groove therein and contacting said bracket.

3. The combination of at least three mercury displacement switches and a mounting bracket, said combination wherein each mercury displacement switch includes first and second neck parts and an enlarged body part located between neck parts, each neck part terminating in a load contact for connection to a power circuit, each switch body part having a generally cylindrical outer surface, each switch including first and second coil terminals for connection to a switch actuating



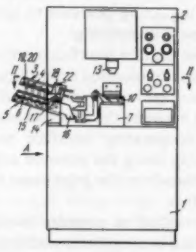
circuit, each body part surface having an eccentric offset center portion forming a groove in the surface extending about approximately one-half of the circumference of the body part and a raised land extending about the other remaining approximate one-half of the circumference of the body part, said bracket including two aligned pairs of spaced protrusions, the spacing between protrusions of each protrusion pair exceeding the width of each switch land, two of said switches positioned side by side and each fitted upon said bracket with the land thereof seating between a pair of protrusions, a third said switch paralleling said two switches and having its land fitting within the switch grooves of said two switches, and strap means extending about said third switch within its said groove and around said two switches and contacting said bracket.

4,144,432

APPARATUS FOR SURFACING VALVES FOR INTERNAL COMBUSTION ENGINES

Anatoly A. Mozzhukhin, ulitsa Pochaininskaya, 23, kv. 43; Daniil A. Dudko, ulitsa Anri Barbjusa, 22/26, kv. 143; Vladimir P. Sotchenko, ulitsa P. Tychiny, 13, kv. 210, and Boleslav I. Maximovich, ulitsa Anri Barbjusa, 22/26, kv. 107, all of, Kiev, U.S.S.R.

Filed Apr. 26, 1977, Ser. No. 791,007
Int. Cl.[2] H05B *5/00;* **B23K** *13/00*
U.S. Cl. 219—9.5 **5 Claims**



1. An apparatus for surfacing valves for internal combustion

engines by fusing refractory alloy rings on effective areas of the valves comprising:

a base;

a manipulator mounted on said base and adapted to receive a valve with a ring to be fused thereon and to position said valve head downwards, said manipulator having a vertically disposed drive shaft;

a heater mounted on said base for fusing a ring and a valve to each other;

a valve clamping device adapted to fix the valve in the heater, said clamping device being mounted on said base over said heater;

a rotating platform, mounted on said base and carrying a valve feed mechanism adapted to feed valves to said heater, a sprayer, and an unloading chute, said sprayer cooling a valve heated by said heater and said unloading chute being adapted to withdraw the valve from said heater;

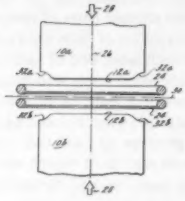
a transfer gear operatively connecting said rotating platform to said vertically disposed drive shaft of said manipulator for sequential positioning under said heater of said valve feed mechanism, said sprayer, and said unloading chute.

4,144,433

METHOD FOR METAL BONDING

John W. Zelahy, Cincinnati, and Terry L. Jones, Middletown, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 16, 1976, Ser. No. 751,160
Int. Cl.[2] H05B *5/00*; B23K *13/00*
U.S. Cl. 219—9.5 **2 Claims**



1. In a method for pressure bonding a plurality of metal components at cooperating interface portions to produce a forged joint about a joint plane between the components, at least a first interface portion having a first interface segment smaller in cross-sectional area than a second segment of the first portion, the method including a first induction heating the cooperating portions to a bonding temperature less than their respective melting temperatures but at which metal upset can occur and then impacting the portions along a pressure axis substantially perpendicular to the joint plane at a high energy rate with a force sufficient to expel metal of each component from between the impacting portions to produce the forged joint, the improvement comprising:

preshaping at least the first interface portion so that the first segment is generally recessed from the second segment in an amount which increases with the differences in cross-sectional areas between the first and second segments;

positioning the cooperating interface portions in spaced apart relationship along the pressure axis so that the first segment is further from the joint plane than is the second segment; and then

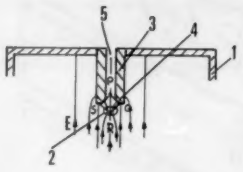
conducting the method of pressure bonding by high frequency induction heating from within the space between the cooperating interface portions and then high energy rate impacting the interface portions to produce the forged joint.

4,144,434

MICROWAVE HEATING DEVICES

Bernard Chiron, and Michel de Vecchis, both of Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed Jun. 14, 1976, Ser. No. 695,919
Claims priority, applicaiton France, Jul, 16, 1975, 75-22199
Int. Cl.[2] H05B *9/06*
U.S. Cl. 219—10.55 F **1 Claim**



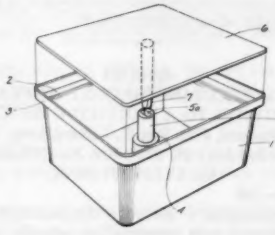
1. In a cylindrical microwave cavity of the type having entrance and exit apertures in opposite end walls and aligned on the longitudinal axis of the cavity and in which the cavity is excited in the TM_{010} mode for the heating of thin thread-like objects fed continuously through the cavity along the longitudinal axis thereof, a hollow plunger positioned in said entrance aperture and having a cylindrical passageway coaxial with the longitudinal axis of the cavity, the inner end of said passageway being conically flared at an angle of 45° to said axis, said plunger being a focusing means for concentrating the energy at a point on said axis near said entrance aperture without disturbing the mode distribution therein.

4,144,435

VESSEL FOR USE IN A MICROWAVE OVEN

Clarence O. Clark; Robert L. DeAngelis; Kenneth F. Deffren; Thomas J. Flautt; Erwin A. Hofmann, and Eugene Weinshenker, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 21, 1977, Ser. No. 853,581
Int. Cl.[2] H05B *9/06*
U.S. Cl. 219—10.55 E **25 Claims**

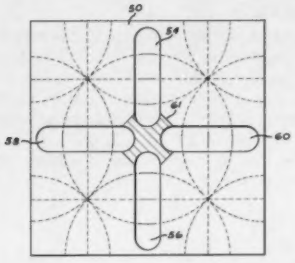


1. A vessel for use in a microwave electromagnetic field for enclosing a product to be heated by microwave energy, said vessel being reflective to said microwave energy, means in association with said vessel to permit the passage of said microwave energy therein to said product and means responsive to a preselected internal temperature of said product to substantially reduce further passage of said microwave energy to said product.

4,144,436
MICROWAVE OVEN EXCITATION SYSTEM FOR PROMOTING UNIFORMITY OF ENERGY DISTRIBUTION

Harold S. Hauck, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jun. 17, 1976, Ser. No. 697,238
Int. Cl.[2] H05B 9/06
U.S. Cl. 219—10.55 F 11 Claims



1. In a microwave oven of the type including a source of microwave energy of a predetermined center frequency and wavelength, a rectangular waveguide having an end coupled to the source of microwave energy, and a box-like rectangular cooking cavity capable of supporting a plurality of electromagnetic standing wave modes, an excitation system comprising:

a relatively flat mode stirrer cavity including a mode stirrer, said mode stirrer cavity having a horizontal extent sufficient to support a plurality of half-waves of standing wave energy in each of two orthogonal orientations, said mode stirrer cavity thus being a resonant cavity capable of storing microwave standing wave energy, and said mode stirrer cavity having an opening in one side wall connected to receive microwave energy from the other end of the waveguide;

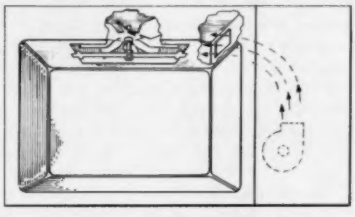
a fixed common wall separating said mode stirrer cavity and the cooking cavity; and

at least two aperture elements of generally slot configuration in said common wall for coupling microwave energy from said mode stirrer cavity into the cooking cavity, said aperture elements being oriented at right angles to each other.

4,144,437
MICROWAVE OVEN ENERGY STIRRER

Bruce W. Ehlers, Wayzata, Minn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jul. 29, 1977, Ser. No. 820,106
Int. Cl.[2] H05B 9/06
U.S. Cl. 219—10.55 F 5 Claims

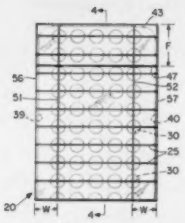


2. An apparatus for effecting a random microwave energy distribution in a microwave oven comprising a transition zone located between a microwave energy source and a microwave cooking cavity; a shaft positioned vertically in said zone; an energy stirrer having a plurality of blades attached to a hub, said hub including a bore sized to loosely fit said shaft, said bore having a conical projection at its interior end adapted to ride on said shaft; means for passing air through said zone to impinge on at least a portion of said blades to cause said energy stirrer to rotate within said zone.

4,144,438
MICROWAVE ENERGY MODERATING BAG

Stephanie S. Gelman; Edward J. Maguire, Jr., and Haydee R. Guilloty, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sep. 28, 1977, Ser. No. 837,073
Int. Cl.[2] H05B 9/06; B65D 85/00
U.S. Cl. 219—10.55 E 11 Claims

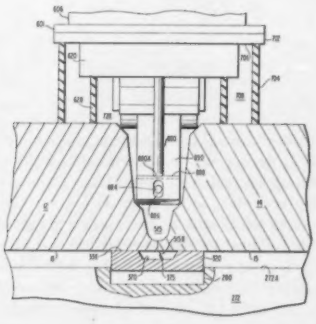


1. A microwave energy moderating bag comprising a laminated sheet of material having a perforate, electrically conductive foil lamina disposed intermediate and secured by lines of bonding between two laminae of substantially microwave transparent films of material having a relatively high dielectric constant, said sheet being U-folded and provided with relatively high capacitance duplex side seams, said bag further comprising an open top end and means for said top end to be closed sufficiently to substantially obviate the passage of microwave energy of a predetermined frequency therethrough.

4,144,439
AUTOMATIC PIPE WELDING APPARATUS

Nuke M. Chang, Santa Anna, Calif., and Robin Renshaw, St. Charles, Ill., assignors to Santa Fe International Corp., Orange, Calif.

Filed Feb. 11, 1977, Ser. No. 767,769
Int. Cl.[2] B23K 9/02
U.S. Cl. 219—60 A 13 Claims



1. An automatic welding system, in which a pair of pipe ends are arranged end to end, comprising:

welding means, including a welding torch, which overlies the facing ends of said pipes, said welding means being rotatable around the circumference of said pipes to weld said facing ends;

at least one reference surface provided on at least one of the

facing ends of said pipe lengths, said reference surface defining an arc gap control guide surface for said welding means; and

surface engaging means for engaging the interior surface portions of said facing pipe length ends, said surface engaging means including back-up band means which is independently radially and circumferentially expandable and contractable, said back-up band means having sufficient radial, circumferential and axial dimensions to concurrently contact interior surface portions of the facing ends of both said pipe lengths in a continuous circumferential manner, and said back-up band means having a circumferential recess formed therein which defines a space for receiving inwardly flowing weld material from a weld produced by said welding means.

4,144,440

METHOD AND APPARATUS FOR CONTROLLING WELDING OPERATIONS DURING RESISTANCE WELDING

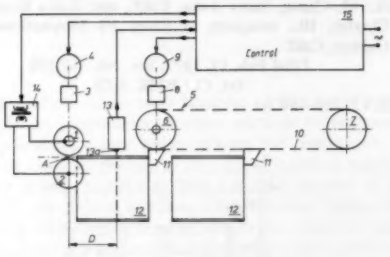
Fred E. Schalch, Le Landeron, and Anton Szoky, Colombier, both of Switzerland, assignors to Fael SA, Saint-Blaise, Switzerland

Continuation-in-part of Ser. No. 588,473, Jun. 19, 1975, abandoned. This application Mar. 3, 1978, Ser. No. 883,168

Claims priority, application Switzerland, Jun. 21, 1974, 8510/74

Int. Cl.[2] B23K *11/06, 11/24*

U.S. Cl. 219—61.5 **32 Claims**



1. A method of controlling the beginning of welding and the end of welding during continuous resistance welding by means of an alternating-current at a roll-welding machine, comprising the steps of: providing a welding station for the resistance welding of workpieces moving in a predetermined direction of travel to said welding station, determining at least at one measuring station arranged ahead of the welding station and through which pass the workpieces to be welded the position of a leading end and a trailing end of a workpiece to be welded as a function of time with respect to the frequency and phase of the welding current, deriving thereby a measurement value, processing the measurement value in order to accommodate the speed of travel of the workpiece to be welded and the frequency and phase of the welding current to one another in such a manner that the first weld spot and the last weld spot is applied at an adjustable spacing from the leading end and the trailing end, respectively, of the workpiece to be welded.

4,144,441

ELECTRODE METHOD FOR WELDING THIN STEEL SHEETS

Paul Hantelmann, Darmstadt, Fed. Rep. of Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 20, 1977, Ser. No. 862,340

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658053

Int. Cl.[2] B23K *35/30*

U.S. Cl. 219—74 **5 Claims**

1. In a method of welding thin steel sheets by the use of the MAG welding process wherein carbon dioxide is used as the protective gas, the improvement being welding the thin steel sheets by means of an electrode made from a copper -manganese alloy made of copper, manganese, nickel and silicon comprising 3–35% Mn, 0–15% Ni, 0.02–0.7% Si, and the remainder being copper to minimize any tendency toward solder cracks and corrosion.

4,144,442

PROCESS FOR PRODUCING A COMPONENT PART OF A RAILWAY SWITCH OR A RAILWAY CROSSING AND COMPONENT PART OF RAILWAY SWITCHES OR RAILWAY CROSSINGS PRODUCED BY SUCH PROCESS

Hubert Augustin, Loeben; Eduard Friesenbichler, Zeltweg, and Alfred Moser, Leoben, all of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed May 23, 1977, Ser. No. 796,246

Claims priority, application Austria, May 18, 1976, 3605/76

Int. Cl.[2] B23K *11/04*

U.S. Cl. 219—106 **11 Claims**

1. Process for producing a component part of a railway switch or of a railway crossing in which frogs consisting of austenitic manganese steel casting are, with interposition of an intermediate piece, connected by a welding operation with rails consisting of carbon steel, characterized in that the intermediate piece is welded to the portions of the frog or of the component part of the railway crossing which are to be connected with the rails, and in that this intermediate piece consists of austenitic steel, whereupon the frog or the component part of the railway crossing is, together with the intermediate piece, heated to a temperature at which any embrittlement of the workpiece is removed, and whereupon the frog or the component part of the crossing having the intermediate piece welded thereto is rapidly cooled, and whereupon the rail is welded to the intermediate piece and subsequently the welding area is allowed to slowly cool, the intermediate piece having a smaller height than the rail and the frog or the component part of the railway crossing, and further characterized in that prior to heating the frog or component part of the railway crossing and the intermediate piece, a cladding layer forming the running surface and consisting of wear-resistant manganese steel is applied.

4,144,443

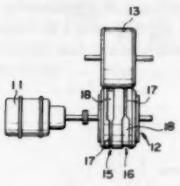
APPARATUS FOR HORIZONTAL FILLET WELDING OF STEEL PLATES

Yoshinori Ito, Nishinomiya; Masaaki Kawai, Ashiya, and Masahiko Ikeda, Minoo, all of Japan, assignors to Sumitomo Metal Industries Limited, Osaka, Japan

Division of Ser. No. 654,950, Feb. 3, 1976, Pat. No. 4,058,700. This application Sep. 1, 1977, Ser. No. 829,655

Int. Cl.[2] B23K *9/00*

U.S. Cl. 219—137.7 2 Claims



1. An apparatus for horizontal fillet welding together a vertical steel plate and a horizontal steel plate butted together in a T-shape and having a line of intersection, comprising a pair of welding wires, means for alternately feeding said wires at different rates of feed, a power supply nozzle through which said wires are fed, said power supply nozzle being directed toward said line of intersection and so disposed that one of said wires is fed to said vertical plate and the other of said wires is alternately fed to said horizontal plate, a welding power source connected to said nozzle and to one of said plate for passing an electric current alternately through said wires for the fillet welding of said plates, means for moving said nozzle along said line of intersection; and wherein said feed means comprises a feed roll rotatable at a constant speed, said roll having a pair of parallel guide grooves around on the outer peripheral surface thereof, guide grooves respectively receiving said welding wires, and a pressure roll in rotating contact with said outer surface of said drive roll; each of said guide grooves consisting of a narrow portion and a wide portion, said narrow portion of each guide groove having a sectional dimension substantially equal to the diameter of each welding wire and serving to feed each welding wire to said power supply nozzle when said presure roll is in contact with said narrow portion so as to engage each welding wire with said pressure roll, said wide portion of each guide grooves having a sectional dimension greater than the diameter of each welding wire and serving to stop the feeding of each welding wire to said power supply nozzle by separating each welding wire from the surface of said pressure roll when said wide portion is in contact with said pressure roll, said narrow and wide portions being so disposed relative to one another that when one of said guide grooves for the welding wire to be fed to said vertical steel plate is in contact at its narrow portion with said pressure roll, another of said guide grooves for the welding wire to be fed to the horizontal steel plate is in contact at its wide portion with said pressure roll, and when said one guide groove is in contact at its wide portion with said pressure roll, said another guide groove is in contact at its narrow portion with said pressure roll; and the ratio of the length of said narrow portion to said wide portion of the guide groove for said welding wire to be fed to said vertical steel plate is in a range of 1:1 to 1:4, whereby said welding wires are fed alternately to said vertical steel plate and to said horizontal steel plate in a proportion of the ratio of 1:1 to 1:4.

4,144,444

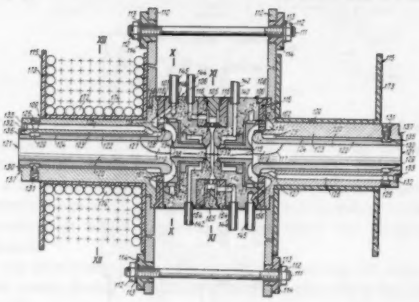
METHOD OF HEATING GAS AND ELECTRIC ARC PLASMOCHEMICAL REACTOR REALIZING SAME

Valentin V. Dementiev, Voiskovoi pereulok, 13, kv. 6; Anatoly I. Zhidovich, Leninsky prospekt, 72a, kv. 109; Alfred L. Mosse, Leninsky prospekt, 72a, kv. 66; Oleg I. Yasko, ulitsa Kalinovskogo, 73, korpus 2, kv. 5, all of Minsk; Lev S. Polak, ulitsa Obrucheva, 18, kv. 22, Moscow; Genrikh V. Gulyaev, ulitsa Obrucheva, 16, kv. 103, Moscow; Rafail I. Levenzon, ulitsa Krasikova, 17, kv. 39, Moscow; Nikolai L. Volodin, Revoljutsionnaya ulitsa, 7, kv. 12, Sterlitamak; Filipp B. Vurzel, Bolotnikovskaya ulitsa, 38, korpus 6, kv. 40, Moscow, and Alexandr N. Laktjushin, ulitsa Zakharova, 40, kv. 25, Minsk, all of U.S.S.R.

Filed Mar. 20, 1975, Ser. No. 560,235

Int. Cl.[2] H05B *7/18;* B01K *1/00;* B23K *9/00*

U.S. Cl. 219—383 8 Claims



1. A method of producing a synthesis gas for the manufacture of vinyl chloride which comprises feeding a gaseous or vaporized hydrocarbon into an intermediate gas plasma jet, said intermediate gas plasma jet being selected from the group consisting of chlorine, hydrogen chloride and mixtures thereof with hydrogen, and mixing the hydrocarbon with the intermediate gas plasma jet to heat the hydrocarbon by a rotary electric arc supplying additional heat to the gas and said gas plasma jet by said rotary electric arc.

4,144,445

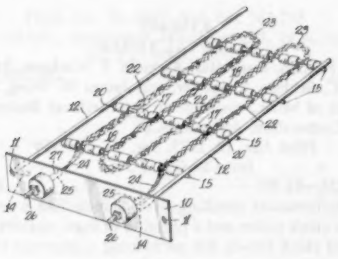
OPEN COIL ELECTRIC HEATERS

Carlisle Thweatt, Jr., Pulaski, Va., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Dec. 27, 1977, Ser. No. 864,621

Int. Cl.[2] H05B *3/06*

U.S. Cl. 219—532 11 Claims



1. An electric heating assembly of the open coil type, comprising:

a pair of rigid, laterally spaced support members,

a plurality of rigid, spaced cross-members disposed crosswise of said support members and secured thereto to form a generally plane supporting frame, and

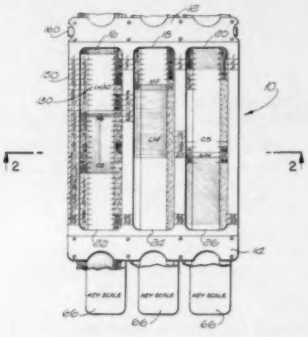
an elongated heating member supported by and insulated from said frame and including reflexed portions providing spaced reaches extending crosswise of said cross-members and disposed generally within the plane of said frame, said heating member comprising a plurality of strands combined side-by-side, that portion of each reach adjoining a cross-member being constructed and arranged to have holding interengagement with the cross-member to thereby hold said reaches to said cross-member.

4,144,446

BIORHYTHM CALCULATOR

Lincoln L. Sanders, 22204 Mariano St., Woodland Hills, Calif. 91367

Filed Feb. 6, 1976, Ser. No. 655,910
Int. Cl.[2] G06C *3/00*
U.S. Cl. 235—85 FC **11 Claims**



1. A biorhythm calculator comprising:

a rhythm scale member having a major surface, said surface having a biorhythm cycle identified thereon, said cycle being identified by numbers of the days of said cycle, said numbers being divided into three identified groups corresponding to high, low, and critical periods of said cycle; and

a key scale member having a major surface parallel to the major surface of said rhythm scale member, said major surface of said key scale member being calibrated to identify figures indicating biorhythm positional relationship for said biorhythm cycle, said rhythm scale member and said key scale member being movable relative to one another whereby said figures can be compared to said identified groups to indicate said periods of said cycle corresponding to said figures.

4,144,447

INTERVAL TIMER

Bryce G. Fossum, Rochester; Kenneth J. Markson, Mazeppa; Phillip C. Schloss, Rochester, and James W. Wing, Zumbro Falls, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 12, 1977, Ser. No. 786,918
Int. Cl.[2] G06M *3/02*
U.S. Cl. 235—92 PE **8 Claims**

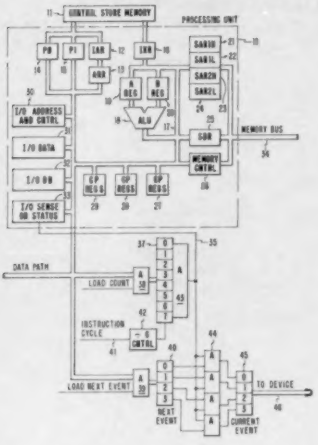
1. An information handling system including a source of successive clock pulses and a plurality of logic circuits responsive to said clock pulses, for performing a sequence of operations comprising;

a continuously running delay counter;

connecting means for connecting said continuously running counter to said source of clock pulses and providing said continuously running delay counter an uninterrupted sequence of pulses during successive cycles of operation of said continuously running delay counter;

gate means connected to said delay counter and operable to generate an output signal to said plurality of logic circuits when said delay counter attains a predetermined fixed value; and

means for adding the next event delay count to said delay



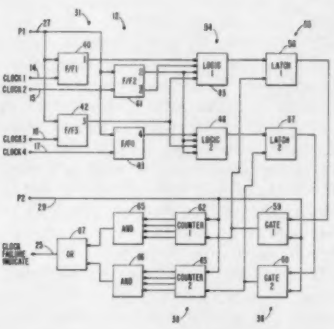
counter between said successive clock pulses received by said counter subsequent to the previous output signal at any time prior to the expiration of the next event delay, whereby the occurrence of each event is timed from the occurrence of the next preceding event.

4,144,448

ASYNCHRONOUS VALIDITY CHECKING SYSTEM AND METHOD FOR MONITORING CLOCK SIGNALS ON SEPARATE ELECTRICAL CONDUCTORS

Emilio C. Pisciotta, Boulder, and Tony G. Thornock, Longmont, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 29, 1977, Ser. No. 855,632
Int. Cl.[2] G06F *11/00*
U.S. Cl. 235—301 **21 Claims**



1. A system for monitoring a plurality of separate electrical conductors for a series of transitions of line signals separately occurring on each of said conductors, said signals being timed by a first clock means, said system comprising:

timing signals generating means providing first and second timing signals independent of the timing of said clock means such that said timing signals are asynchronous with respect to said line signals on said electrical conductors;

signal processing means connected with said timing signal generating means to receive said first timing signal there-

from and connected with said plurality of electrical conductors to sense transitions of said line signals on each of said conductors and responsive thereto for producing an output signal dependent upon said sensed series of transitions following a given transition;

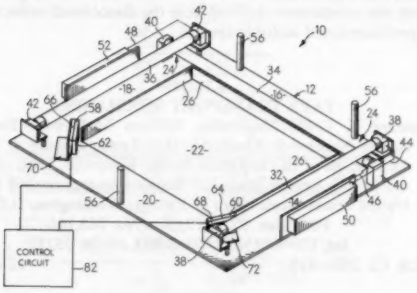
timing means in said fault determining means responsive to said given transition indicating a predetermined time period after said given transition; and

fault determining means connected with said timing signal generating means to receive said second timing signal therefrom and connected with said processing means to receive said output signal therefrom and responsive therefrom for producing a fault indication in the absence in said output signal of a sensed series of transitions on said conductors within said predetermined time period after said given transition.

4,144,449
POSITION DETECTION APPARATUS

Buddy K. Funk, Bountiful, and Clark L. Smith, Salt Lake City, both of Utah, assignors to Sperry Rand Corporation, New York, N.Y.

Filed Jul. 8, 1977, Ser. No. 814,060
Int. Cl.[2] G01D *21/04*
U.S. Cl. 250—221 **11 Claims**



1. Position detection apparatus, comprising:

means defining an open work area;

means arranged partially about said work area so as to provide continuous emission of a solid pattern of light through said work area from angularly displaced adjoining portions of the perimeter thereof;

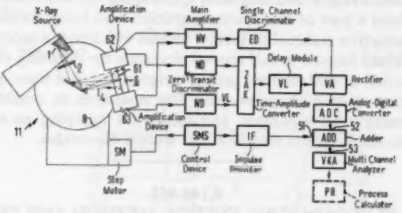
means located adjacent said work area at opposite ends of said light emission means for respectively defining first and second coincident fields of light emitted through and encompassing said work area from said light emission means with a portion of said light in each of said first and second coincident fields being emitted from a common portion of said light emission means; and

means located adjacent each of said opposite ends of said light emission means and adjacent said each field defining means for viewing and receiving a corresponding one of said respective first and second fields of light in contiguous angular segments thereof and sensing the interruption of light in one or more of said segments of said respective field and thereby at any location within said work area.

4,144,450
X-RAY POWDER DIFFRACTOMETER

Herbert Goebel, Graefelfing, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 22, 1977, Ser. No. 818,086
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1976, 2637945
Int. Cl.[2] G01N *23/20*
U.S. Cl. 250—272 **4 Claims**



4. An X-ray powder diffractometer for diffraction analysis by generation of an intensity diagram produced by X-rays dispersed by a sample, comprising:

(a) a detector means having a position sensitive element means for producing position signals corresponding to the position at which detected X-rays strike the element means;

(b) step motor means for continuously advancing the detector means during measurement along an arc over a desired angle;

(c) control means connected to the step motor means for producing impulses corresponding to steps of the step motor;

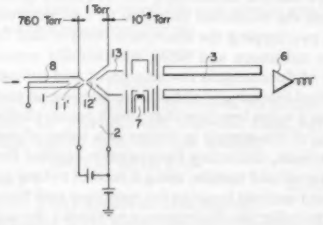
(d) analog-digital converting means for converting the detector means position signals to corresponding impulses; and

(e) adding means for periodically summing the impulses corresponding to the detector position signals arriving at the moment and for maintaining a sum of all impulses which have arrived from the step motor control means at any given moment, the adding means adding the two sums together periodically to provide a composite sum corresponding to an angle at which a dispersed X-ray is received by the detector along the arc.

4,144,451
MASS SPECTROMETER

Hideki Kambara, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed Jan. 26, 1977, Ser. No. 762,718
Claims priority, application Japan, Jan. 28, 1976, 51-7500
Int. Cl.[2] B01D *59/44*
U.S. Cl. 250—281 **11 Claims**



1. An atmospheric pressure ionization mass spectrometer comprising an ionization region maintained at about atmo-

spheric pressure for ionizing a sample, a mediate pressure region maintained at about 0.1 to 10 Torr and a highly evacuated mass spectral region provided at its upstream side with auxiliary ionization means, a first partition wall separating said ionization region and said mediate pressure region for each other, at least a part of said partition wall being made of a conductive material to form a first electrode, a first fine aperture formed in said first electrode for effecting communication of said ionization region and said mediate pressure region with each other, a second partition wall separating said mediate pressure region and said mass spectral region from each other, at least a part of said second partition wall being formed of a conductive material to form a second electrode, a second fine aperture formed in said second electrode for effecting communication of said mediate pressure region and said mass spectral region with each other, said fine apertures in combination forming a jet separator, and means for applying an electric potential between said first and second electrodes.

4,144,452

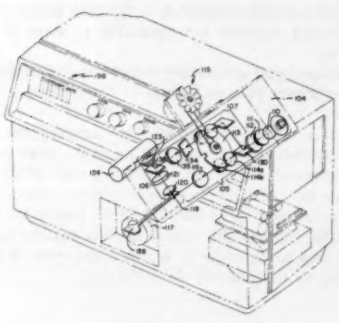
FLUOROMETRIC SYSTEM, METHOD AND TEST ARTICLE

Richard A. Harte, Redwood City, Calif., assignor to International Diagnostic Technology, Inc., Santa Clara, Calif.

Continuation of Ser. No. 703,579, Jul. 8, 1976, Pat. No. 4,056,724, which is a continuation-in-part of Ser. No. 447,574, Mar. 4, 1974, Pat. No. 3,913,687, and a continuation-in-part of Ser. No. 553,582, Feb. 27, 1975, Pat. No. 3,992,631. This application Oct. 26, 1977, Ser. No. 845,669

Int. Cl.[2] G09K *3/00*

U.S. Cl. 250—302 **1 Claim**



1. In a method for analyzing a sample by fluorometric techniques, the steps of disposing said sample on a carrier member having a surface portion adapted for receiving and supporting said sample thereon as an exposed layer presenting a surface for analysis at an analysis location, illuminating said sample with excitation radiation from a first optical system intersecting said analysis location for delivering said radiation to the surface thereat, controlling the frequency of said illumination to limit the excitation radiation to a predetermined frequency band overlapping the absorption band of said fluorometrically active substance and being substantially non-emissive in the band of fluorometric re-emission of said substance, restricting the total intensity of radiation impinging at said analysis location to a value less than that which causes photo-bleaching and fading of the sample in excess of a value of one percent (1%) per minute, collecting fluorescence emitted from the exposed surface of said sample, using a second optical system intersecting said analysis location for receiving said fluorescence, filtering the collective fluorescence to restrict the sensitivity thereof to a frequency band overlapping the emission spectra of said fluorometrically active substance and to be substantially non-responsive in the band of excitation radiation, detecting and countering said collective fluorescence, said collecting, filtering and detecting steps having a combined efficiency of at least five percent (5%) over the emission band peak.

4,144,453

METHOD AND DEVICE FOR EXCITATION AND SELECTIVE DISSOCIATION BY ABSORPTION OF LASER LIGHT AND APPLICATION TO ISOTOPIC ENRICHMENT

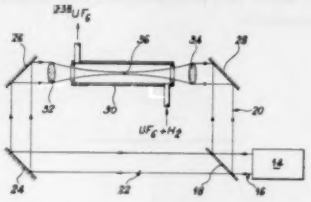
Paul Rigny, Sceaux, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 2, 1976, Ser. No. 738,136

Claims priority, application France, Nov. 12, 1975, 75 34503

Int. Cl.[2] H01J *27/00*

U.S. Cl. 250—423 P **7 Claims**



1. A method of excitation and of selective dissociation by absorption of the monochromatic light emitted by at least one high-power laser, wherein the laser light is sent at a frequency ν_1 into an isotopic mixture of gas molecules in which a certain number of said molecules exhibit transitions between two vibrational levels corresponding to a predetermined isotope and separated by an energy interval $\Delta E_1 = 2h\nu_1$, the molecules of a predetermined isotopic species are thus preferentially excited until subsequent dissociation into a number of constituents, and a gas is added to the mixture which added gas reacts with the constituents derived from the dissociated molecules of a predetermined isotopic species.

4,144,454

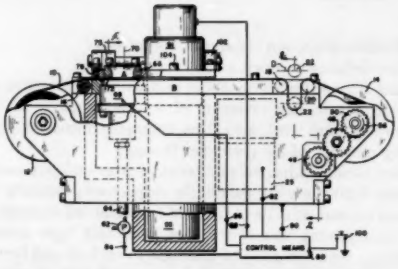
TAPE TRANSPORT MECHANISM

Edward F. Groh, Naperville; William McDowell, Downers Grove; Norbert S. Modjeski, Oak Lawn; Donald J. Keefe, Lemont, all of Ill., and Peter Groer, Knoxville, Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 27, 1977, Ser. No. 763,164

Int. Cl.[2] G01N *21/30;* **B65H** *25/04, 25/32*

U.S. Cl. 250—435 **12 Claims**



1. A device for transporting a tape in a stepwise manner along a particular path between a feed reel and a takeup reel, comprising:

an indexer, oscillator means coupled to said indexer for oscillating said indexer linearly between a maximum and minimum point wherein at said maximum point said indexer displaces the tape from said particular path a maximum amount and at said minimum point said indexer

displaces said tape from said particular path a minimum amount, forward brake means capable upon activation of preventing the tape from moving between the feed reel and said indexer in the direction from said feed reel to said takeup reel, reverse brake means capable upon activation of preventing the tape from moving between the takeup reel and said indexer in the direction from said takeup reel to said feed reel, control means coupled to said indexer and said forward and reverse brake means such that with said indexer moving from said minimum to said maximum point, said control means activates said reverse brake means, and such that with said indexer moving from said maximum to said minimim point said control means activates said forward brake means, and forward drive means coupled to said takeup reel for taking up displaced tape with said forward brake activated, said forward drive means including a rack gear mounted on said indexer and moving together therewith in said linear oscillating motion, and gearing so engaged with the takeup reel and said rack gear that with said indexer moving from said maximum to said minimum point said rack gear drives said gearing which drives the takeup reel in a direction so that the tape displaced by said indexer is collected by said takeup reel.

4,144,455

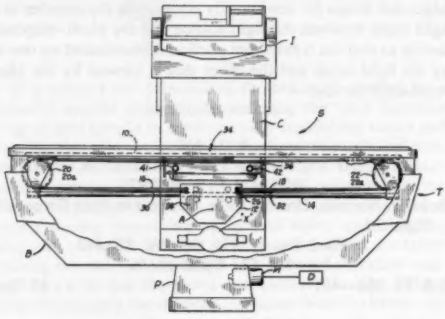
X-RAY TABLE LOCKOUT APPARATUS AND METHOD

Ronald E. Lutz, Cleveland; Henry R. Sokol, Broadview Heights, and Jack R. Sorwick, Novelty, all of Ohio, assignors to Picker Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 668,624, Mar. 19, 1976, abandoned. This application Jun. 16, 1977, Ser. No. 807,176

Int. Cl.[2] G01M *21/34, 23/04*

U.S. Cl. 250—444 **9 Claims**



1. An X-ray table comprising:

(a) a top tiltable through a range of positions including a horizontal position;

(b) power drive structure for controllably tilting the table top;

(c) means for sensing a malfunction of the table; and

(d) control circuitry for inhibiting powered motion of the table top following sensing of a malfunction, said circuitry including:

(i) first switching circuitry for sensing whether said table top is in said horizontal position;

(ii) lockout circuitry connected to the drive structure and responsive to said first switch circuitry for interrupting operation of the drive structure when the table top reaches the horizontal position;

(iii) actuator means for cooperatively causing resumption of table top tilting following said interruption;

(iv) bypass circuitry responsive to the sensing means for preventing said motion resumption in response to the sensing of said malfunction, and also responsive to the absence of said malfunction sensing for cooperating with said actuator for effecting said motion resumption.

4,144,456

APPARATUS FOR IRRADIATING A FLOWABLE SUBSTANCE

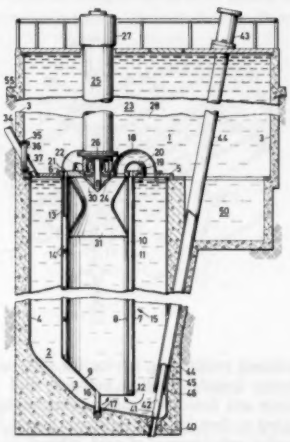
Ernst Bosshard, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Sep. 10, 1976, Ser. No. 722,093

Claims priority, application Switzerland, Sep. 12, 1975, 11865/75

Int. Cl.[2] G01N *21/26*

U.S. Cl. 250—437 **8 Claims**



1. An apparatus for radioactively irradiating a flowable substance comprising:

a wall defining an irradiation chamber for the flowable substance;

a hollow cylindrical radiation source carrier disposed within said chamber, said carrier having an inner wall surface and an outer wall surface defining an interior annular space;

a support member secured to said carrier and mounted on said wall to support said carrier on said wall;

a plurality of radioactive radiation sources disposed in said interior annular space of said carrier in parallel relation to the longitudinal axis of said annular space;

means for circulating the flowable substance within said chamber consecutively over said inner and outer wall surfaces of said carrier;

a chamber above said support member filled with a radiation-shielding liquid, said shielding chamber being sealed from said irradiation chamber, and

a plurality of orifices in said support member communicating said shielding chamber with said interior annular space of said carrier whereby said liquid fills said annular space and cools said radiation sources therein.

4,144,457

TOMOGRAPHIC X-RAY SCANNING SYSTEM

Richard D. Albert, 317 Hartford Rd., Danville, Calif. 94526

Filed Apr. 5, 1976, Ser. No. 674,059

Int. Cl.[2] A61B *6/02*

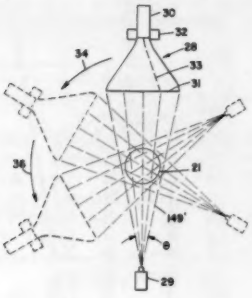
U.S. Cl. 250—445 T **32 Claims**

1. Tomographic X-ray apparatus comprising:

at least one scanning X-ray source having an anode plate and an electron gun for directing at least one electron beam toward said anode plate and having first beam deflection means for sweeping said electron beam relative to said anode plate to produce X-rays at successive points along a

predetermined path on said anode plate, said X-ray source also having means for producing a first deflection signal which varies in accordance with the position of the moving point of impact of said electron beam on said anode plate along said predetermined path,

at least one X-ray detector spaced from said source whereby a subject to be scanned may be disposed therebetween, said detector having at least one active X-ray-sensitive area substantially smaller than the area of said anode plate of said source with all active radiation-sensitive area being confined to a region no broader than the length of said predetermined path and having means for producing count signals indicative of X-rays received along a plurality of successive X-ray paths extending from said successive points on said anode plate to said detector,



a rotational positioning device for effecting predetermined relative angular motion between said subject and said source and detector structure and having means for producing a first angular position signal indicative of the angular relationship of said subject to said source and detector structure, and

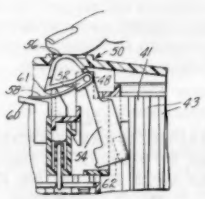
a data processing system coupled to said X-ray source and said detector and said rotational positioning device to receive said signals therefrom and having means for determining variations of X-ray transmissiveness at different areas of said subject from said signals which different areas of said subject lie on the surface defined by said plurality of successive X-ray paths.

4,144,458

SMOKE DETECTOR WITH TEST MEANS FOR SIMULATING A PREDETERMINED CONCENTRATION OF SMOKE

William F. Doherty, Halifax, Mass., assignor to Chloride Incorporated, Tampa, Fla.

Filed Nov. 29, 1977, Ser. No. 855,623
Int. Cl.[2] G01N *21/26*
U.S. Cl. 250—574 **6 Claims**



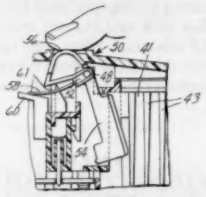
1. In a smoke detector of the photo-electric type which includes a light source providing a light beam and photo-responsive means viewing transversely a portion of the light beam, the improvement comprising test means for simulating a predetermined smoke concentration, said means comprising a substantially opague plate and means for temporarily positioning the plate in the light beam between the light source and the photo-responsive device so that the plate is illuminated on one side by the light beam and the other side is viewed by the photo-responsive device, said plate having a light transmitting portion spaced from the edges thereof, said light transmitting portion allowing a predetermined amount of light to pass therethrough when the plate is so positioned in the light beam.

4,144,459

SMOKE DETECTOR WITH TEST MEANS FOR SIMULATING A PREDETERMINED PERCENTAGE OF SMOKE

William J. Malinowski, Pembroke, Mass., assignor to Chloride Incorporated, Tampa, Fla.

Filed Nov. 29, 1977, Ser. No. 855,624
Int. Cl.[2] G01N *21/26*
U.S. Cl. 250—574 **8 Claims**



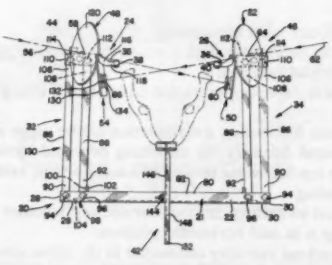
1. In a smoke detector of the photo-electric type which includes a light source providing a light beam and photo-responsive means viewing transversely a portion of the light beam, the improvement comprising test means for simulating a predetermined percentage of smoke, said means comprising a member having a translucent portion at the extreme forward edge, and means for temporarily positioning the member in the light beam between the light source and the photo-responsive device so that the translucent portion is illuminated on one side by the light beam and the other side is viewed by the photo-responsive device.

4,144,460

METHOD AND DEVICE FOR RADIOGRAPHING HUMAN JAW JOINTS

Royal L. Norman, Omaha, Nebr., assignor to Rinn Corporation, Elgin, Ill.

Filed Sep. 6, 1977, Ser. No. 830,413
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—451 **17 Claims**



1. A radiographing device adapted for application to a patient's head for mounting on and support thereby for radiographing the patient's jaw joints, said device comprising:

a frame including:

a pair of opposed end portions positioned to be disposed one on either side of the patient's head and each including plug fit means for making plug fit relation with patient's ears

for pivotally mounting the frame on the patient's head for pivotal movement about a pivot axis extending between the patient's ears,

said frame carrying a film holder and an X-ray beam locator,

said holder and locator being spaced apart to receive the patient's head therebetween and being disposed in substantial parallelism and aligned with a common radiographing axis extending normally of same,

said holder and locator being oriented on said frame such that in one position of adjustment of said frame about said pivot axis, said common radiographing axis passes through the patient's jaw joint to be radiographed,

said frame including releasable holding means for engaging the patient's head at a point spaced from said pivot axis to releasably hold said frame at said position of adjustment against movement about said pivot axis relative to the patient's head, for radiographing of the patient's jaw joint to be radiographed.

4,144,461

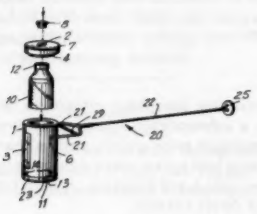
METHOD AND APPARATUS FOR ASSAY AND STORAGE OF RADIOACTIVE SOLUTIONS

Herman Glasser, New Hyde Park, and Patrick F. Panetta, East Islip, both of N.Y., assignors to Victoreen, Inc., Cleveland, Ohio, by said Herman Glasser

Filed Jan. 17, 1977, Ser. No. 759,777

Int. Cl.[2] G21F *5/00;* **G01T** *1/167, 1/00*

U.S. Cl. 250—506 **25 Claims**



1. In a method for determining the radiation emitted by a radioactive sample comprising measuring the total radiation activity of said sample in a substantially unshielded vessel and comparing this measurement with the breakthrough radiation emitted after shielding the sample, the improvement which comprises substantially reducing radiation exposure during said measuring by placing said radioactive sample in a shielded container having removable upper and lower end closures; closing said container; placing said closed, shielded container containing the radioactive sample in a shielded radiation measuring device so that the lower end closure becomes affixed therein; disengaging the shielded container from the lower end closure, removing it from the radiation measuring device, thereby leaving behind the radioactive sample; and measuring the radiation of said unshielded sample.

2. The method of claim **1**, wherein the radiation being measured is gamma radiation.

4,144,462

EMERGENCY LIGHTING FLUORESCENT PACK

Richard L. Sieron, Fairfield; Edward P. Kozek, Southbury, and William P. Shine, Monroe, all of Conn., assignors to Dual-Lite, Inc., Newtown, Conn.

Filed Apr. 28, 1977, Ser. No. 791,953

Int. Cl.[2] H02J *9/06;* **H05B** *41/29*

U.S. Cl. 307—66 **72 Claims**

1. An emergency lighting fluorescent pack for use with fluorescent fixtures using one or more fluorescent lamps and a lamp ballast to operate the lamps when powered by a source of utility AC, comprising:

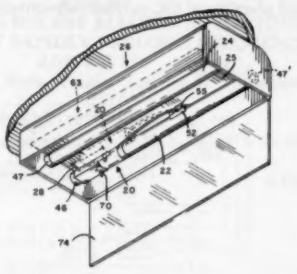
(A) a housing mountable to the fluorescent fixture in a portion of the space normally used by one of the fluorescent lamps, having means for electrically connecting a fluorescent lamp to the fluorescent fixture socket adjacent the housing, said lamp having a length shorter than that normally used in the fluorescent fixture and able to be operated by the lamp ballast, the other end of the shorter lamp electrically connected to the opposite fixture socket, the housing having a length when combined with said shorter fluorescent lamp substantially equal to the length of fluorescent lamps normally used in said fluorescent fixture;

(B) a battery pack incorporating one or more batteries;

(C) a battery charger electrically connected to said battery pack for charging the batteries incorporated in said battery pack when normal utility AC power is present;

(D) means, powered by said battery pack, for generating emergency power for illuminating said shorter fluorescent lamp;

(E) means, interconnectable with said shorter fluorescent



lamp and interconnected to the emergency power generating means, for providing the generated emergency power to said shorter lamp;

(F) transfer circuitry interconnected to said battery pack and emergency power generating means having means for sensing utility AC power and for providing activation of said emergency power generating means when the utility AC power level falls below a predetermined level; and

(G) means, interconnectable between unswitched utility AC power and said battery charger and transfer circuitry, for providing alternating current power to said battery charger and transfer circuitry;

whereby the emergency lighting pack allows utility AC to power the fluorescent lamps when the utility AC is operating normally and generates emergency electricity to power the shorter fluorescent lamp in an emergency mode operation when the utility AC falls below said predetermined level.

4,144,463

STABILIZED DC POWER SUPPLY DEVICES FOR PROVIDING A PLURALITY OF DC POWER OUTPUTS WHICH ARE SELECTIVELY CONSUMED

Naokatsu Sugiura, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan

Filed May 17, 1977, Ser. No. 797,785

Claims priority, application Japan, May 20, 1976, 51-58260; May 20, 1976, 51-64409[U]

Int. Cl.[2] H02J *1/00*

U.S. Cl. 307—75 **15 Claims**

1. A stabilized DC power supply device for providing a plurality of DC power outputs which are selectively consumed, comprising:

a DC power source;

a single power control means coupled to said DC power source and providing high frequency AC outputs with controlled powers from said DC power source, said power control means comprising a DC-AC inverter circuit and means for receiving a control signal and controlling powers of the AC outputs from said DC-AC inverter circuit, said DC-AC inverter circuit including an inverter

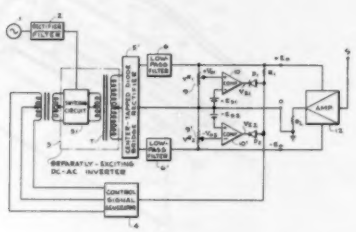
transformer having a plurality of secondary windings, from each of which a high frequency AC output with a predetermined voltage is taken out;

a plurality of rectifier circuit means coupled to said plurality of secondary windings to respectively rectify said high frequency AC outputs present on said secondary windings;

a plurality of low pass filter circuit means coupled to said plurality of rectifier circuit means to remove ripples from outputs of said rectifier circuit means and to provide said plurality of DC outputs with predetermined voltages to output lines, respectively;

a plurality of reference voltage sources, each reference voltage of which is predetermined in relation to said predetermined voltage of each corresponding one of said plurality of DC outputs;

a plurlaity of voltage sensing means for sensing voltages of said plurality of DC outputs respectively;



a plurality of voltage comparator means, each of which compares the reference voltage of each one of said reference voltage sources with the sensed voltage by a corresponding one of said voltage sensing means to provide an error signal, output voltages of said voltage comparator means being equal to one another when said plurality of DC outputs are maintained at said predetermined voltages;

means for detecting a DC output which is being consumed by comparing output voltages of said voltage comparator means to one another and for applying the error signal from one of said voltage comparator means corresponding to said detected DC output to a control signal generator means;

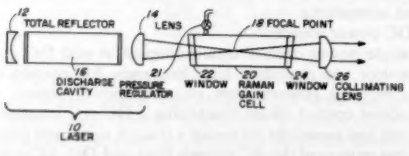
and said control signal generator means for providing said control signal from said applied error signal to control powers of said AC outputs from said power control means so that the voltage of said detected DC output is regulated to its predetermined voltage.

4,144,464

DEVICE AND METHOD FOR NORESONANTLY RAMAN SHIFTING ULTRAVIOLET RADIATION

Thomas R. Loree, and Dean L. Barker, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 25, 1978, Ser. No. 872,292
Int. Cl.[2] H03F *7/00*
U.S. Cl. 307—88.3 **25 Claims**



1. A method of shifting ultraviolet radiation comprising:

retaining a molecular gaseous medium in an irradiation cell at a preselected pressure;

irradiating said molecular gaseous medium with said ultraviolet radiation at a predetermined power density and predetermined focal interaction length;

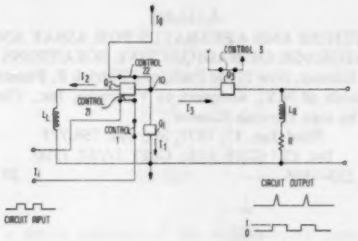
enhancing power output of a preselected frequency signal by varying said preselected pressure, said predetermined power density and said predetermined focal interaction length.

4,144,465

SELF-RESETTING JOSEPHSON DEVICE CIRCUIT

Sadeg M. Faris, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1977, Ser. No. 811,800
Int. Cl.[2] H03K *3/38, 5/153*
U.S. Cl. 307—277 **16 Claims**



1. A self-resetting Josephson circuit for responding to one transition in a substantially square wave type waveform by producing an output pulse and for responding to a complementary transition in said square wave type waveform to reset itself to thereby provide a self-resetting circuit comprising:

a source of direct current;

a first current conducting circuit connected to said source and includng a first Josephson device therein, said first current conducting circuit responsive to said one transition in said square wave type waveform for switching to a voltage state to thereby impede current flow therethrough;

an output circuit connected in parallel to said first Josephson device, said output circuit including a second Josephson device and impedance means serially connected thereto, for producing an output pulse with a leading edge as current switches into said output circuit and a trailing edge as said second Josephson device switches to a voltage state in response to current therethrough exceeding a current threshold of said second Josephson device; and

resetting circuit means also connected to said dc source and including a third Josephson device therein and responsive to a complementary transition of said square wave type waveform for switching to a voltage state to thereby steer current back into said first Josephson device.

4,144,466

DAMPING VIBRATIONS IN VOICE COIL ACTUATOR

Michael R. Hatch, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 30, 1977, Ser. No. 838,345
Int. Cl.[2] H02K *41/02*
U.S. Cl. 310—13 **9 Claims**

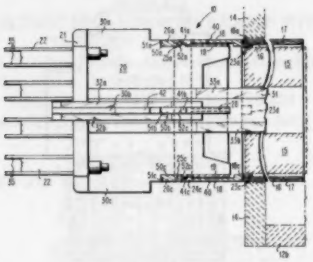
1. An electromagnetically controlled longitudinally movable actuator comprising:

a pair of concentric members at least partially overlapping each other;

an electrically conductive coil secured to one of said members;

an assembly secured to the other of said members;

stiffening means comprising damping material disposed radially between and adhered to the overlapping surfaces of said members for transmitting a part of the forces in shear between said coil and said assembly during longitudinal movement of the actuator responsively to energization of said coil, said damping material also serving to damp longitudinal resonances excited by energization of said coil; and



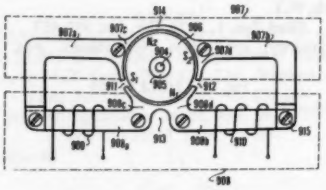
auxiliary stiffening means connecting said coil and assembly in parallel with said damping material, said auxiliary stiffening means being of different stiffness than the damping material disposed between said members to transmit the remaining part of such shear force and limit natural frequency change in the actuator arising from variations in temperature of said damping material.

4,144,467

PULSE MOTOR

Fumio Nakajima, Tokyo; Akira Nikaido, Fuchu; Mitsuo Onda, Oomiya; Takayasu Machida, Iruma, and Takashi Toida, Tokyo, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Division of Ser. No. 420,698, Nov. 30, 1973, Pat. No. 3,958,167.
This application Jul. 31, 1975, Ser. No. 600,904
Int. Cl.[2] H02K *37/00*
U.S. Cl. 310—49 R **1 Claim**



1. A thin, reversible, pulse-actuated motor for use in a timepiece, said motor comprising:

a circular rotor formed as a single member of small axial dimension rotatable about an axis and having a plurality of angularly spaced permanent-magnet poles of alternating magnetic polarity, the arc distances between the centers of the successive rotor poles being equal;

a planar stator rotatably receiving said rotor and coplanar therewith, said stator having:

a pair of arc-segmental pole pieces directly opposite one another across said axis, one of said pole pieces extending arcuately around said rotor over an arc length in excess of 180° and being circumferentially spaced from the other of said pole pieces by a pair of air gaps, each of said pole pieces defining a pair of arcuate stator poles connected together by a thin arcuate connecting member;

respective yokes connecting the stator poles of said pair of pole pieces which are separated by each of said gaps, each of said yokes having:

a first shank integral with the respective stator of said pole pieces,

a second shank parallel to the respective first shank and integral with the respective stator pole of said other pole piece, and

a member bridging the first and second shanks of each yoke; and

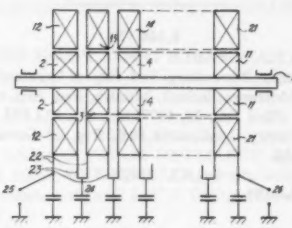
a respective exciting coil on each of said second shanks, said coils being the only coils of said motor and being energizable, said pole pieces being spaced from said rotor by constant and equal distances, the arc lengths of each of said stator poles being less than 360°/n where n is the number of rotor poles.

4,144,468

AMPLIFYING ROTARY ELECTRICAL MACHINE OPERATING AT RAPIDLY VARIABLE FREQUENCIES AND LEVELS

Georges Mourier, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 25, 1977, Ser. No. 845,404
Claims priority, application France, Oct. 29, 1976, 76 32714
Int. Cl.[2] H02K *11/00*
U.S. Cl. 310—72 **6 Claims**



1. A rotary electrical machine comprising a series of rotors assembled upon one and the same axle and rotating about the axis thereof in operation, and a stator assembly, characterised in that said stator assembly is made up of elementary stators each arranged opposite one of said rotors and electrically equivalent in each case to self-inductances, said elementary stator being associated with storage elements in order to form cascade-connected cells each constituting a stator, successively passing the wave associated with alternating signals applied to the input of the first of said cells.

4,144,469

STRESS PROTECTION FOR PERMANENT MAGNET TYPE SYNCHRONOUS MOTOR

Kunio Miyashita; Hironori Okuda, both of Hitachi; Seizi Yamashita, Katsuta, and Shoji Tanabe, Sakura, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 8, 1977, Ser. No. 822,788
Claims priority, application Japan, Aug. 9, 1976, 51-94710
Int. Cl.[2] H02K *21/12*
U.S. Cl. 310—156 **6 Claims**

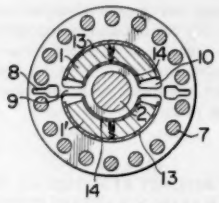
1. A rotor of a permanent magnet type synchrnous motor comprising:

a rotary shaft;

a rotor body including a plurality of core sections each of which is in the form of a lamination of a magnetic material, a reinforcement section of a nonmagnetic material interposed between the core sections, said core and reinforcement sections being alternately mounted on the rotary shaft and secured thereto, and a plurality of cavities axially formed in the core and reinforcement sections by passing therethrough, said cavities being each defined by

inner and outer walls in the form of a substantial circular arc which are concentric with the rotary shaft and two radial walls;

a permanent magnet received in the respective cavities which has substantially the same configuration as the cavity including inner and outer surfaces in the form of a substantial circular arc; and



magnet protecting means including a first strap interposed between at least the outer circular arc wall of the respective cavities and the outer surface of the permanent magnet opposing the outer circular arc wall, said first strap covering the entire outer surface of said permanent magnet to protect said permanent magnet from forces caused by high speed rotation of the rotor body.

4,144,470

POLE CHANGEABLE THREE PHASE WINDING

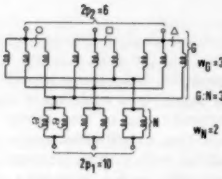
Herbert Auinger, Nüremberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 30, 1977, Ser. No. 811,992

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1976, 2629642

Int. Cl.[2] H02K *3/00*

U.S. Cl. 310—198 **39 Claims**



1. In a pole changeable three phase winding for a fractional pole pair number ratio of first and second pole numbers p_1 and p_2 which is $p_1:p_2 = (3m \pm 1):3n$ with $p_2 = 3n$ being an integral multiple of the number of phases, and m and n positive integers, the improvement comprising:

(a) a total of $2p_1/t$ equal winding branches for each of the three phases, a number G divisible by three of said equal winding branches comprising base winding branches and the remaining number N of said equal winding branches comprising zero branches whereby a division into base winding branches and zero branches having the relationship $G + N = 2p_1/t$, where t is an integral divisor of the first pole number is established;

(b) means for establishing a connection of the three phases, for the first pole number $2p_1$, to the respective groups of G base winding branches;

(c) means to couple the three phases to said G base winding branches for the second pole number such that one third of each of the G winding in each group is coupled to the same respective phase; and

(d) said zero branches connected to said base winding branches such that they are ineffective at the second pole number $2p_2$.

4,144,471

ROTATING ANODE X-RAY TUBE

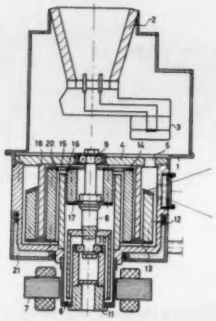
Walter Hartl, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 23, 1977, Ser. No. 863,932

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658513

Int. Cl.[2] H01J *35/10*

U.S. Cl. 313—60 **9 Claims**



1. An x-ray tube comprising an envelope, a shaft mounted for rotation in said envelope, an elongated anode body having a central hole extending longitudinally therethrough, said anode body being disposed coaxially about and spaced from said shaft to define with said shaft an annular space therebetween extending from one end of said body substantially along the entire length of said body, a cathode mounted in said envelope and arranged to direct a beam of electrons onto said one end of said anode body and means for connecting the end of said body remote from said cathode to said shaft to thereby reduce the conduction of heat from said one end of said body to said shaft.

4,144,472

GLOW DISCHARGE LAMP

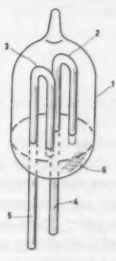
Hermanus van Loon, and Henricus G. A. Willems, both of Terneuzen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 1, 1978, Ser. No. 911,457

Claims priority, application Netherlands, Jun. 2, 1977, 7706037

Int. Cl.[2] H01J *61/06*

U.S. Cl. 313—217 **1 Claim**



1. A glow discharge lamp having an envelope and a discharge space therein containing a rare gas and two substantially identical filamentary internal electrodes, only one end of each electrode having a respective feedthrough connection, the other end being embedded in said envelope enclosing the discharge space, characterized in that the electrodes are U-shaped, the control plane in which the U of one U-shaped

electrode is located being substantially parallel to the corresponding plane in which the other U-shaped electrode is located, and in that imaginary lines connecting corresponding points of the two electrodes are substantially perpendicular to the planes of these electrodes, the spacing between the two legs of each electrode being smaller than 2½ mm, and the spacing between the two planes exceeding the leg spacing and being furthermore smaller than 5 mm.

4,144,473

ELECTRIC INCANDESCENT LAMP WITH CYLINDRICAL FILAMENT

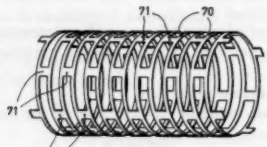
Friedrich H. R. Almer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 23, 1977, Ser. No. 799,883

Claims priority, application Netherlands, Jun. 28, 1976, 7607038

Int. Cl.² H01K *1/14*

U.S. Cl. 313—315 **10 Claims**



1. An electric incandescent lamp having a light pervious lamp envelope in which a hollow cylindrical filament is arranged which is connected at its ends to current conductors, said filament comprising a plurality of first electrically conductive strips having a four-sided transverse cross-section each extending at least the major parts of the circumference of the cylinder, said first strips being spaced apart in the axial direction of the cylinder and being interconnected by a plurality of second strips having a four-sided transverse cross-section and extending mainly in the axial direction of said cylinder, at least some of said strips being arranged to form electrically parallel current paths at least over portions of the length of said filament.

4,144,474

LOW NOISE RESISTANCE CONTAINING SPARK PLUG

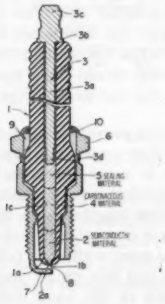
Kanemitsu Nishio, and Shunichi Takagi, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Jun. 23, 1977, Ser. No. 809,246

Claims priority, application Japan, Jun. 29, 1976, 51-76869

Int. Cl.² H01T *1/16, 12/20*

U.S. Cl. 315—53 **2 Claims**



1. In a resistance containing spark plug comprising an elongated hollow cylindrical heat resisting insulator having a central longitudinal through hole; a spark electrode received in and partially exposed from the spark end of the insulator through hole; a noise suppressing resistance material inserted into the through hole of the insulator and having a predetermined height starting from the upper end of the spark electrode; a terminal electrode having an inner portion secured in the through hole of the insulator in contact with the resistance material and an outer portion adapted to be connected to an external power source; and a ground electrode spaced by a predetermined gap from the spark electrode, the improvement characterized by: (a) said spark electrode comprising a semiconductive material having a relatively low electrical resistance, relatively high resistances to sparking and heat deterioration, relatively high thermal conductivity, and relatively high resistance to oxidation, said semiconductive material comprising a first main component of high melting point sealing glass composition containing SiO_2, Al_2O_3 and B_2O_3, a second main component of metal alloy powder having a high oxidation resistance at high temperatures, and lesser amounts of oxides and inorganic substances, (b) said noise suppressing resistance material comprising a carbonaceous layer above the spark electrode and having a relatively high electrical resistance, and a sealing layer above the carbonaceous layer and having a relatively low electrical resistance and high adhesion properties, said sealing layer being in contact with the terminal electrode, and (c) the spark end of the insulator through hole being at least partially closed to define a reduced diameter end opening.

4,144,475

GAS AND/OR VAPOR DISCHARGE LAMP

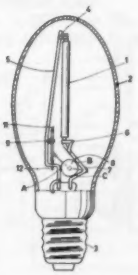
Robert R. M. Delen, and Duido J. J. Lenaerts, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 21, 1978, Ser. No. 879,479

Claims priority, application Netherlands, Apr. 15, 1977, 7704134

Int. Cl.² H01J *61/52*

U.S. Cl. 315—73 **1 Claim**

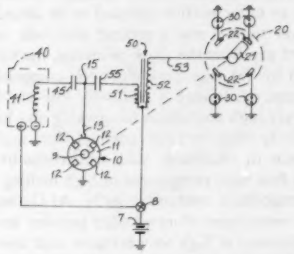


1. A gas and/or vapour discharge lamp comprising a discharge tube and an outer bulb enveloping said tube in spaced relationship, two stiff electric supply conductors supplying current to said discharge tube, an electric circuit component for operating said discharge tube being disposed in the space between said discharge tube and said outer bulb, said electric circuit component being clamped between said two stiff supply conductors, said electric circuit component being a glow starter, at least one of said supply conductors having a bend in the region of said electric circuit component, said one supply conductor bearing against said electric circuit component on both converging sides of said bend.

4,144,476
MULTIPLE DOUBLE ENERGY MODULATION IGNITION SYSTEM

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Filed Jul. 18, 1977, Ser. No. 816,714
Int. Cl.[2] H05B 37/02, 39/04, 41/36
U.S. Cl. 315—209 R 8 Claims

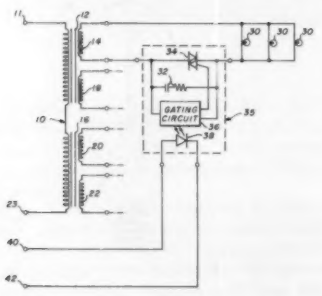


1. A multiple double energy modulation ignition system, comprising the combination of:
- an ignition transformer having a primary winding and a secondary winding;
- a first circuit composed of the primary winding and a first capacitor in series therewith;
- a second circuit composed of a second capacitor and an inductor in series therewith, said first and second capacitors having a common electrical junction; and
- means electrically connected to the common junction for providing intermittent electrical connection between said junction and an electrical return of the system.

4,144,477
LONG LIFE INCANDESCENT SWITCHING SYSTEM

Favre E. Eaton, Winsted, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jul. 14, 1977, Ser. No. 815,619
Int. Cl.[2] H05B 39/00
U.S. Cl. 315—276 3 Claims

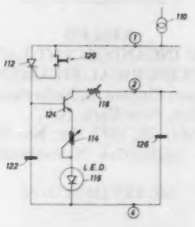


1. A switching and supply circuit for supplying power to a load which operates at a normal current level but is subject to occasional high current surges, the load having first and second sides, comprising:
- a. a current limiting transformer having at least one secondary winding with first and second terminals, the first terminal in electrical communication with the first side of the load; and
- b. a solid-state switch connected in series with the second terminal of the secondary winding and the other side of the load.

4,144,478
LAMP SYSTEM TAKE CONTROL DIMMING CIRCUIT

Eric L. H. Nuver, San Marcos, Tex., assignor to Esquire, Inc., New York, N.Y.

Filed Aug. 11, 1977, Ser. No. 823,710
Int. Cl.[2] H05B 37/02, 39/04
U.S. Cl. 315—291 10 Claims

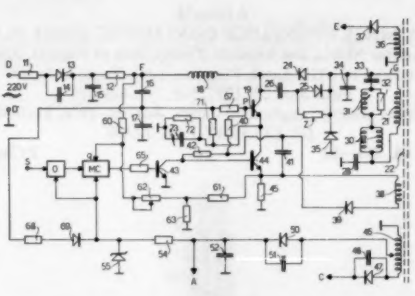


1. A take control circuit for providing intensity control to a light dimming network in the form of variable dc voltage, comprising
- a constant current generator,
- a gated semiconductor device, one of the main terminals being connected to said generator,
- a variable electronic resistor connected to another main terminal of said device, and
- gate means for causing conduction of said device thereby enabling said resistor to operate as means for determining a dc voltage level for setting of light intensity.

4,144,479
CIRCUIT FOR PROVIDING SAW-TOOTH CURRENT IN A COIL

Attilio Farina, and Giuseppe Zappala', both of Turin, Italy, assignors to Indesit Industria Elettrodomestici Italiana S.p.A., Turin, Italy

Filed Sep. 21, 1977, Ser. No. 835,375
Claims priority, application Italy, Oct. 11, 1976, 69437 A/76; Oct. 11, 1976, 69438 A/76
Int. Cl.[2] H01J 29/70, 29/76
U.S. Cl. 315—408 12 Claims



1. In a circuit for providing a saw-tooth current exhibiting a trace interval having an initial, a central and a final part and a retrace interval in a coil, particularly a deflection coil of a kinescope, comprising a trace condenser and a retrace condenser which form together with said coil a resonant circuit during the retrace interval, a first diode connected parallel to the retract condenser with such polarity that the current of said coil makes said first diode conductive during the initial and central parts of the trace interval, and a controllable switch provided with a control electrode connected to a source of periodical signals which make said switch conductive during the central and final parts of the trace interval, said

controllable switch being connected to a voltage supply source through a first inductor and to the retrace condenser through a second diode connected with such polarity that the current of said coil makes said second diode conductive during the final part of the trace interval, the improvement wherein:

a first condenser (**26** or **26'**) is connected, at one side thereof, to a common junction of said inductor (**18** or **18'**), said controllable switch (**19**) and said second diode (**24**) and, at the other side thereof, to a common junction of said first diode (**35**), said second diode (**24**) and said retrace condenser (**34**) through a circuit comprising a third diode (**25**) in parallel with a serially-connected second inductor (**80**, **112** or **113**) and storage device (**81**, **116** or **114**),

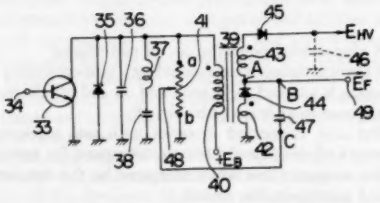
said first condenser and said first and second inductors being respectively of such capacity and inductance that, during nonconductive intervals of said controllable switch, energy is supplied by said first inductor in charging relation to said first condenser and, during each intervening conductive interval of said controllable switch, said first condenser is discharged substantially instantaneously into said second inductor which thereafter supplies its thus stored energy to said storage device for the remainder of said conductive interval.

4,144,480

HIGH VOLTAGE GENERATING APPARATUS

Tadashi Nagasaki; Mitsuharu Akatsu, and Mitsuo Otsu, all of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 4, 1977, Ser. No. 756,864
Claims priority, application Japan, Jan. 9, 1976, 51-1549
Int. Cl.[2] H01J *29/70*
U.S. Cl. 315—411 **7 Claims**



1. A high voltage generating apparatus comprising:

a horizontal output circuit for generating flyback pulse during a blanking period of horizontal scanning;

a flyback transformer including a primary winding and a first and a second secondary windings for boosting said flyback pulse;

a plurality of diodes, at least one of said diodes being connected with said first secondary winding to form a lower voltage series circuit and at least one other of said diodes being connected with said second secondary winding to form a higher voltage series circuit which is connected with said lower voltage series circuit with an intermediate point therebetween;

means for supplying the high D.C. voltage required for a picture tube across said lower and higher voltage series circuits;

a variable voltage-dividing circuit connected with the primary winding of said flyback transformer;

a focus capacitor one terminal of which is connected to said intermediate point of said series circuits, the other terminal of said focus capacitor being connected to said variable voltage-dividing circuit; and

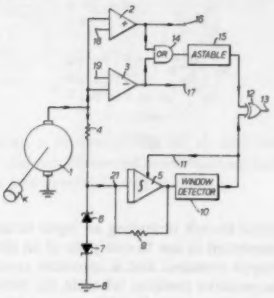
means for supplying the variable focus D.C. voltage at said intermediate point to a picture tube as a focus control voltage therefor.

4,144,481

CONTROL DEVICES

Graham J. Clarke, St. Albans, England, assignor to Marconi Instruments Limited, Chelmsford, England

Filed Mar. 16, 1977, Ser. No. 778,257
Claims priority, application United Kingdom, Mar. 18, 1976, 10888/76
Int. Cl.[2] H02P *5/16*
U.S. Cl. 318—331 **14 Claims**



1. A control device suitable for controlling an electronic apparatus and adapted to produce an output signal in response to rotation of a control member comprising in combination:

a d.c. ironless motor having a rotatable member connected with a control member and which generates back e.m.f. when rotated by the control member; and

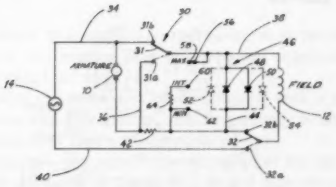
signal generating means connected to said motor for generating said output signal in response to the generated back e.m.f.

4,144,482

DYNAMIC BRAKE CIRCUIT FOR MOTOR

Christopher M. Schwab, Cupertino, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Apr. 7, 1977, Ser. No. 785,342
Int. Cl.[2] H02P *3/12*
U.S. Cl. 318—381 **6 Claims**



1. In a dynamic brake circuit for a universal motor having an armature and a field winding, the combination comprising:

a brake resistor;

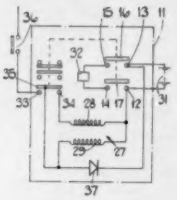
voltage limiting means; and

switch means operable between a first position and a second position, said first position connecting said armature in series with said field winding and to a power source, said second position disconnecting said power source and connecting said brake resistor in series with said field winding and with said armature and further connecting said voltage limiting means in parallel with said field winding whereby to decelerate said armature while maintaining the voltage across the field generally constant.

4,144,483
ELECTRICAL POLARITY SWITCH FOR BATTERY

Derek Thornley, Nelson, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Nov. 1, 1976, Ser. No. 737,706
Claims priority, application United Kingdom, Nov. 29, 1975, 49179/75
Int. Cl.[2] H02J 7/00
U.S. Cl. 320—25 10 Claims

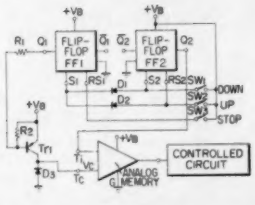


1. An electrical switch including an input terminal which is electrically connected in use to one pole of an electric storage battery, an output terminal and a movable contact movable between an inoperative position wherein the movable contact is isolated from at least one of said input and output terminals and an operative position wherein said movable contact electrically interconnects said input and output terminals, an electro-magnet winding which, when energized prevents movement of said movable contact to said operative position, said winding and a semi-conductor diode being connected in series between said input terminal and a further terminal which in use is connected to the other pole of said battery, said diode being so orientated with respect to the intended battery connection polarity that the diode conducts to energize said winding and so prevent movement of the movable contact to its operative position in the event that reversed polarity connections are made between the battery and said input and further terminals, an electromagnetic means energizable in the operative position of said movable contact to return said movable contact to said inoperative position.

4,144,484
DC VOLTAGE CONTROL DEVICE

Shunji Minami, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 27, 1977, Ser. No. 864,452
Claims priority, application Japan, Jan. 17, 1977, 52-4307
Int. Cl.[2] G05F 3/08
U.S. Cl. 323—19 5 Claims

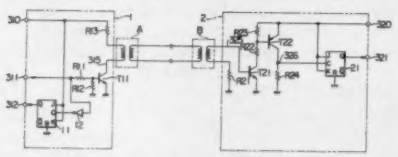


1. A DC voltage control device comprising
(a) an analog memory comprising
a MOS field-effect transistor, and
a nonpolarized capacitor
(b) a first R-S flip-flop connected to a first input terminal of said analog memory,
(c) a second R-S flip-flop connected to a second input terminal of said analog memory,
(d) a first diode connected between a second set input terminal of said second R-S flip-flop and a first set input terminal of said first R-S flip-flop,
(e) a second diode connected between a second rest input terminal of said second R-S flip-flop and a first set input terminal of said first R-S flip-flop,
(f) a down switch connected to said second set input terminal of said second R-S flip-flop,
(g) an up switch connected to said second reset input terminal of said second R-S flip-flop, and
(h) a stop switch connected to said first reset input terminal of said first R-S flip-flop,
whereby the output of said analog memory may be controlled by the operations of said down, up and stop switches.

4,144,485
CONTACTLESS CONNECTOR CIRCUIT

Sigeyuki Akita, Okazaki, Japan, assignor to Nippon Soken, Inc., Nishio, Japan

Division of Ser. No. 627,889, Oct. 31, 1975, abandoned. This application May 27, 1977, Ser. No. 801,251
Claims priority, application Japan, Dec. 3, 1974, 49-139938
Int. Cl.[2] H02P 13/16, 13/04
U.S. Cl. 323—44 R 3 Claims

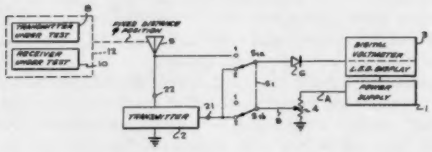


1. A contactless connector circuit comprising:
first electric circuit means including a semiconductor switch which is adapted to be rendered on and off alternately in response to an input pulse signal;
a first coil, connected in series with said semiconductor switch of said first electric circuit means, for generating a first magnetic flux when energized by the conduction of said semiconductor switch;
a first case securely enclosing said first coil therein;
a second coil for generating a first a.c. signal in response to the changes of sair first magnetic flux during the magnetic coupling with said first coil;
a second case securely enclosing said second coil therein and detachably mating with said first case to cause the magnetic coupling between said first and second coils;
conductor means connected to said second coil for transmitting said first a.c. signal;
a third coil, connected to said conductor means, for generating a second magnetic flux in response to the changes of said first a.c. signal applied through said conductor means;
a third case securely enclosing said third coil therein;
a fourth coil for generating a second a.c. signal in response to the changes of said second magnetic flux during the magnetic coupling with said third coil;
a fourth case securely enclosing said fourth coil therein and detachably mating with said third case to cause the magnetic coupling between said third and fourth coils; and
second electric circuit means including another semiconductor switch connected to said fourth coil for reshaping said second a.c. signal into an output pulse signal, said another semiconductor switch being responsive to one of positive and negative polarities of said second a.c. signal such that said output pulse signal is synchronized with said input pulse signal.

4,144,486
APPARATUS FOR TESTING METAL DETECTORS

Robert M. Kaye, Arlington; Gary A. Eiloo, Burke, both of Va., and Thomas N. Tucker, Oxon Hill, Md., assignors to Washington Gas Light Company, Washington, D.C.

Filed Aug. 27, 1976, Ser. No. 718,345
Int. Cl.[2] H04B 17/00; G01V 3/12; G01R 35/00
U.S. Cl. 324—3 2 Claims



1. Apparatus for testing the operability of devices having a low-power, low-frequency radio transmitter and a receiver tuned to receive signals from said radio transmitter, comprising:

an antenna which is resonant at the frequency of operation of a said device being tested,

transmitter means connected to said antenna for supplying a signal at the frequency of operation of a said device being tested for radiation from said antenna,

variable power supply means selectively connected to said transmitter for varying the power of the signal produced by said transmitter and radiated from said antenna,

receiver means selectively connected to said antenna or to said transmitter for, respectively, providing a voltage output corresponding to the field strength of a signal received by said antenna, or providing a voltage output corresponding to the power of the signal supplied by said transmitter,

voltage measuring means for providing an indication of the value of the voltage output from said receiver means,

switch means for connecting an input of said receiver means to said antenna and disconnecting said power from and thereby deactivating said transmitter and, alternatively, for connecting the input of said receiver means to a terminal from which the power output of said transmitter can be sensed and connecting the output of said power supply means to said transmitter and,

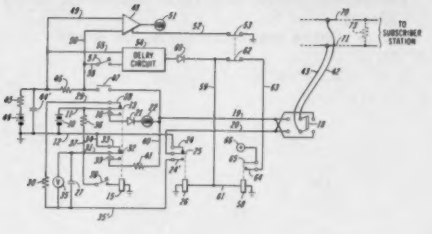
means for receiving and placing a said device to be tested and defining a predetermined, constant distance and orientation of the device to be tested with respect to said antenna to thereby define predetermined, constant field strengths for given transmission levels from the said radio transmitter in said device being tested or said transmitter in said apparatus whereby it can be determined whether said radio transmitter in a said device is producing an output at a predetermined level as it can be determined whether said receiver in a said device is capable of receiving signals at a predetermined level.

4,144,487
ELECTRICAL CABLE FAULT LOCATING APPARATUS

Julian R. Pharney, Reynoldsburg, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 14, 1977, Ser. No. 850,918
Int. Cl.[2] G01R 31/10
U.S. Cl. 324—52 10 Claims

1. Apparatus for locating a fault in an electrical cable comprising a first potential source connectable across conductors of said cable for applying a first potential across said conductors for drying moisture at said fault, a second potential source connectable across said conductors for applying a second potential across said conductors several times greater than said first potential for igniting an arc discharge across said conductors at said fault, means for determining the distance from said apparatus to said fault including means for measuring the peak current of said arc discharge, timing means energized responsive to the application of said second potential for generating a delay signal and means responsive to said delay signal for disconnecting said first potential source from said conductors

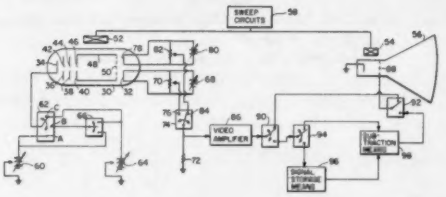


and for applying a reverse potential to said conductors for extinguishing said arc discharge and simultaneously inducing a weld between said conductors at said fault.

4,144,488
INVESTIGATION OF NEAR-SURFACE ELECTRONIC PROPERTIES IN SEMICONDUCTORS BY ELECTRON BEAM SCANNING

George A. Haas, Alexandria, Va.; Arnold Shih, Gaithersburg, and Richard E. Thomas, Riverdale, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 22, 1977, Ser. No. 863,364
Int. Cl.[2] G01R 27/02
U.S. Cl. 324—62 11 Claims



4. A method of investigating the variation in the electron affinity over the surface of a single-crystal semiconductor, which comprises the steps of:

(a) scanning the surface to be investigated with a beam of electrons at a first energy, said first energy being in the retarding-field region of the surface;

(b) producing a first signal representative of the amount of current collected by the surface at said first energy;

(c) storing said first signal;

(d) scanning the surface to be investigated with a beam of electrons at a second energy, said second energy being in the accelerating-field region of the surface;

(e) producing a second signal representative of the amount of current collected by the surface at said second energy;

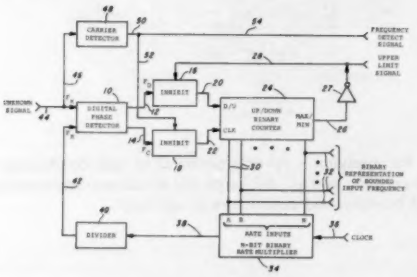
(f) subtracting a signal related to said second signal from a signal related to said stored first signal to produce a combined signal; and

(g) visually displaying the combined signal, a visual presentation being produced wherein bright and dark areas of the presentation represent variations in the electron affinity across the surface.

4,144,489
SIMPLIFIED FREQUENCY TO DIGITAL CONVERTER USING ALL DIGITAL ELECTRONICS

Phillip W. Ward, Dallas, and Halbert H. Bybee, Jr., Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 23, 1974, Ser. No. 508,489
Int. Cl.[2] G01R *23/02*
U.S. Cl. 324—78 D **13 Claims**



1. A system for providing an accurate binary representation of the frequency of an unknown signal comprising:

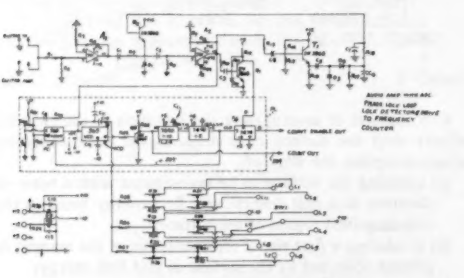
(a) digital phase detector means for generating a digital error signal proportional to the difference in the frequency of said unknown signal and that of a reference signal, and

(b) digital closed loop means responsive to said digital error signal and operatively connected to equalize said reference signal with said unknown signal, said digital closed loop further providing a binary representation of the frequency of said reference signal.

4,144,490
ELECTRONIC SENSING AND MEASURING APPARATUS FOR SIGNALS IN AUDIO FREQUENCY RANGE

Harold E. Stevens, Lyndhurst, Ohio, assignor to Music Specialities Corp., Rocky River, Ohio

Filed Oct. 21, 1976, Ser. No. 734,644
Int. Cl.[2] G01R *23/02*
U.S. Cl. 324—78 D **9 Claims**

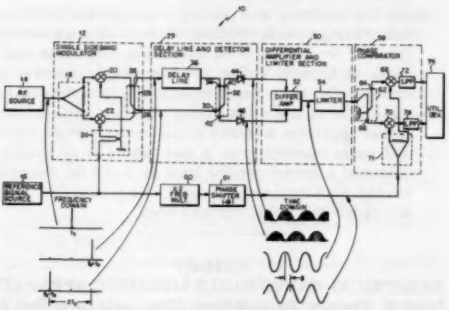


1. An electronic measuring system for determining the frequency of an incoming test signal of a cyclic periodic waveform and which signal may be in the audio frequency range of 0 to 20 kilocycles comprising input circuit means for receiving the test signal to be measured, voltage controller oscillator means connected in circuit with said input circuit means and responsive to said test signal to generate an oscillator output signal whose frequency is a preselected multiple of the frequency of said test signal, signal phase comparator means interconnected to said input circuit means and said oscillator means being operable to compare the phase relationship between said test signal and said oscillator output signal and to provide a phase lock of said oscillator means with the test signal, signal comparator circuit means connected between said oscillator means and said input circuit means being operable to continuously sense the phase relationship between the test signal and the oscillator ouput signal per each cycle and to provide an enabling output signal that is representative of the continuing per cycle phase relationship between said test signal and said oscillator output signal at said comparator circuit means, counter means connected in circuit with said signal comparator circuit means and said oscillator means and responsive to the presence of both said enabling signal and said oscillator output signal and if and only if there is a continuous cycle to cycle coincidence of phase between the oscillator output signal and the test signal to provide a digital count of said oscillator output signal per unit of time to be accumulated in said counter means, and said signal comparator circuit means being operable to sense a phase difference per any cycle of approximately less than one-quarter cycle between the oscillator output signal and the the test signal to enable an accumulation of a digital count that is representative of said test signal and means connected between said comparator circuit means and said counter means operable to sense a phase difference per any cycle of approximately greater than one-quarter cycle between the oscillator output signal and the test signal to automatically terminate the digital count accumulation and the display thereof.

4,144,491
FREQUENCY MEASURING APPARATUS

Robert S. Hutcheon, Goleta, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 3, 1977, Ser. No. 839,133
Int. Cl.[2] G01R *23/00*
U.S. Cl. 324—82 **10 Claims**



1. In combination:

(a) mixer means fed by an input signal and a reference signal for producing upper and lower sideband frequency signals separated in frequency by a fixed offset frequency;

(b) means fed by the upper and lower sideband signals, for providing a differential time delay between the upper and lower sideband frequency signals, shifting the phase of one of such sideband frequency signals an amount, $-\phi$, related to the frequency of the input signal; and

(c) means for combining and detecting the differential time delayed upper and lower sideband frequency signals producing a signal having a frequency related to the offset frequency and a phase angle related to the phase shift $-\phi$.

4,144,492

METHOD FOR MEASURING A VOLTAGE WITH THE AID OF AN ANALOGUE-DIGITAL CONVERTER

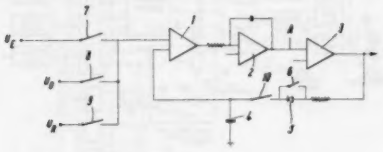
Gero Zschimmer, Adelmannstrasse 5, 8000 Munich 82, Fed. Rep. of Germany

Continuation of Ser. No. 668,697, Mar. 19, 1976, abandoned. This application Oct. 21, 1977, Ser. No. 844,431

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1975, 2514272

Int. Cl.[2] G01R *19/16;* H03K *5/20*

U.S. Cl. 324—103 P 4 Claims



1. A method of measuring the instantaneous value of a fluctuating voltage, with the aid of an analogue-digital converter including an integrator, a comparator and a capacitor being located in a feedback circuit between the output of said comparator and the input of said converter, said method comprising the steps of

applying the fluctuating voltage to the converter thereby causing the voltage across said capacitor to directly follow said fluctuating voltage,

disconnecting said fluctuating voltage at the instant when its value is to be measured while disconnecting said feedback circuit between said comparator and said capacitor to retain a voltage thereon equal to the fluctuating voltage at said instant,

applying a first known voltage to the converter for causing the voltage at the output of the integrator to rise to the value of said first known voltage,

applying a second known voltage to the converter of polarity opposite to that of said first known voltage for causing the voltage at the output of the integrator to be reduced to the value of the voltage stored in said capacitor,

measuring the time for said voltage at the output of said integrator to be reduced to the value of the voltage stored in said capacitor, and

determining the value of said fluctuating voltage at said instant from said measurement.

4,144,493

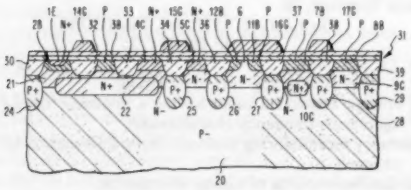
INTEGRATED CIRCUIT TEST STRUCTURE

James H. Lee, Wappingers Falls, N.Y.; Bernd K. S. Lessmann, Magstadt, Fed. Rep. of Germany, and Akella V. Satya, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1976, Ser. No. 701,388

Int. Cl.[2] G01R *31/26;* H01L *7/02*

U.S. Cl. 324—158 R 20 Claims



1. A test structure in a semiconductor substrate for monitoring a plurality of regular monolithic integrated circuits, said test structure comprising:

a plurality of impurity regions which correspond to like impurity regions of said regular circuits with respect to relative disposition and conductivity within said substrate, said corresponding regions being elongated with respect to, but having the same depth and width as, said regular impurity regions; and

at least one other elongated impurity region within said test structure not corresponding to any of said regular impurity regions for providing indications of defect levels in said regular circuits.

4,144,494

METHOD OF MAGNETICALLY TESTING TUBES DURING WELDING WHEREIN THE SAME MAGNETIC FIELD IS USED BOTH FOR HEATING AND TESTING

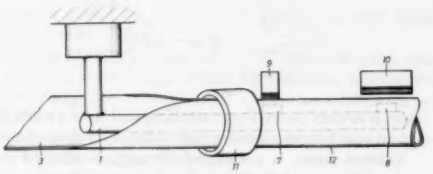
Reinhard Pawelletz, and Heinz Schneider, both of Düsseldorf, Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Sep. 12, 1977, Ser. No. 832,618

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1976, 2641367

Int. Cl.[2] G01R *33/12*

U.S. Cl. 324—220 1 Claim



1. Method of continuously, non-destructively testing tubes which are made by forming metal strip, into the tubular configuration followed by welding adjoining edges of the strip to complete the tube, comprising:

applying at least one magnetic field from one side to progressing areas of the tube by means of an electromagnetic energizing device for purposes of ac heating the edges for obtaining at least one of the following operations, welding and annealing;

detecting a result of an interaction of the heating field with the tube, and from the other side of the tube, by means of pickup transducer means; and

supporting one of the transducer means and the energizing device inside of the tube by means of insertion into the tube from a point ahead of a tube forming location, the respective other one of the device and the means being located outside of the tube.

4,144,495

SATELLITE SWITCHING SYSTEM

Sidney Metzger, Kensington, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Feb. 23, 1977, Ser. No. 773,862

Int. Cl.[2] H04B *7/00*

U.S. Cl. 325—4 14 Claims

1. A satellite system employing onboard switching comprising:

receiving antenna means for providing a multiplicity of up path antenna beams directed toward different areas on the ground,

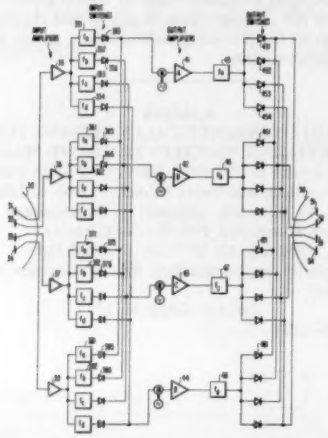
a plurality of input amplifiers connected to said receiving antenna means for amplifying signals received in said multiplicity of up path antenna beams,

a plurality of output amplifiers,

input switch means for connecting the output of only one selected input amplifier to the input of an output amplifier,

transmitting antenna means for providing a multiplicity of down path antenna beams directed toward different areas on the ground,

output switch means for connecting the output of one or more selected output amplifiers to said transmitting antenna means to couple energy into one or more selected down path antenna beams, and



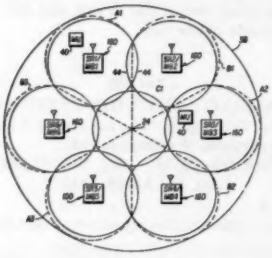
switch control means for controlling said input switch means and said output switch means whereby a desired up path antenna beam is connected through a selected output amplifier to a desired down path antenna beam.

4,144,496

MOBILE COMMUNICATION SYSTEM AND METHOD EMPLOYING FREQUENCY REUSE WITHIN A GEOGRAPHICAL SERVICE AREA

Marion L. Cunningham, Orlando; John R. Endicott, Maitland, and Lionel D. Freeman, Orlando, all of Fla., assignors to Harris Corporation, Cleveland, Ohio

Continuation of Ser. No. 360,559, May 15, 1976, abandoned.
This application Mar. 17, 1976, Ser. No. 667,782
Int. Cl.[2] H04B *7/00*; H04M *11/00*
U.S. Cl. 325—53 **79 Claims**



65. A method for providing broadcast service in a mobile communication system service area comprising the steps of:

directionally broadcasting wave energy from a first location in the service area in a plurality of radially outwardly extending sectors of the service area;

generating an idle channel marker signal; and,

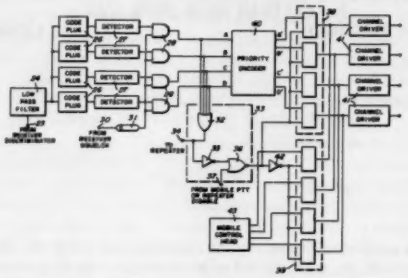
omnidirectionally broadcasting said idle channel marker signal in each of said sectors from locations spaced radially outwardly from said first location generally centrally of each of said sectors.

4,144,497

TWO-WAY COMMUNICATIONS SYSTEM HAVING REMOTE CHANNEL SELECTION

Ralph W. Andrea, III, Sunrise, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 15, 1977, Ser. No. 824,994
Int. Cl.[2] H04B *1/06*
U.S. Cl. 325—302 **5 Claims**



1. A channel selection circuit for remote selection of ones of a plurality of prioritized channels of a multi-channel communications system including in combination:

means for receiving a plurality of transmitted channel selection signals each of said signals corresponding to a predetermined priority of one channel of the system;

a plurality of first detector means coupled to the receiving means and each separately providing an output signal only in response to a different channel selection signal within the received signals;

channel prioritizing means coupled to the detector means for providing an output signal in response to the one received predetermined signal having the highest channel priority and including frist input means for receiving a first predetermined signal from said first detector means, first logic means coupled to the first input means for providing an output signal in response to the reception of the first predetermined signal, said first logic means output signal being the signal for the highest priority channel, second input means for receiving a second predetermined signal from said first detector means, second logic means coupled to provide an output signal in response to the reception of the second predetemined signal in the absence of the first predetermined signal, said second logic means output signal being the signal for the second highest priority channel; and

a plurality of channel driver means coupled to receive the output signal of the channel prioritizing means for enabling the circuitry of the appropriate channel.

4,144,498

TELEVISION TUNING METHOD AND APPARATUS FOR TUNING EMPLOYING SLOPE FACTOR DERIVATION

Akio Tanaka, Chicago, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jul. 15, 1977, Ser. No. 815,893
Int. Cl.[2] H04B *1/26*
U.S. Cl. 325—464 **12 Claims**

1. A television tuning system including:

a voltage controlled tuner having a nonlinear tuning voltage-versus-frequency characteristic;

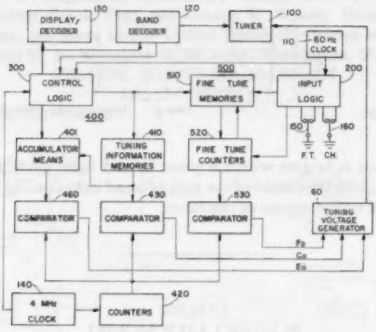
memory means storing nominal tuning information for each channel;

an auxiliary source of tuning information;

means deriving a slope factor for any desired channel from said nominal tuning information by computing the difference in nominal tuning information between different channels;

means proportioning said auxiliary source of tuning information with the derived slope factor; and

tuning voltage means generating a tuning voltage for said tuner from said nominal tuning information for said desired channel and the proportioned auxiliary tuning information.

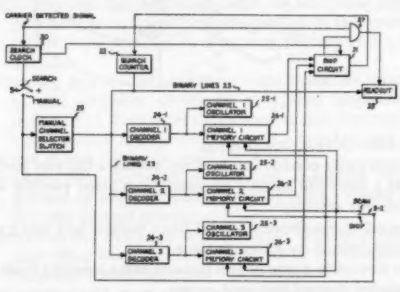


4,144,499

SEARCH CIRCUIT FOR A RADIO RECEIVER

Raymond W. Harris, Rustburg, and Ralph R. Sherman, Jr., Forest, both of Va., assignors to General Electric Company, Lynchburg, Va.

Filed Jul. 28, 1977, Ser. No. 819,863
Int. Cl.[2] H04B 1/32
U.S. Cl. 325—470 **12 Claims**



1. An improved search circuit for a radio receiver having switchable local oscillator means connected to a mixer to cause said receiver to receive a plurality of frequencies, said improved search circuit comprising:

a. first means for producing a repetitive sequence of predetermined channel signals and applying said channel signals to said local oscillator means to cause said local oscillator means to produce a selected frequency signal in response to each of said channel signals;

b. a plurality of memory circuits each having an input coupled to said first means and an output, each of said memory circuits producing a respective skip signal at its output in response to a skip condition in said memory circuit and a respective channel signal from said first means, and producing a scan signal at its output in response to a scan condition in said memory circuit;

c. a skip circuit having a plurality of inputs each of which is respectively coupled to one of said memory circuit outputs, said skip circuit having an output, and said skip circuit producing a skip pulse at said output in response to each skip signal produced at said memory circuit outputs;

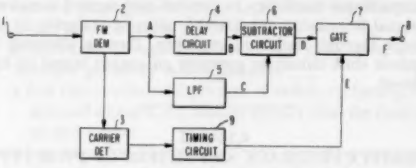
d. and means for applying each of said skip pulses to said first means.

4,144,500

NOISE ELIMINATION FOR FM DEMODULATORS

Tadatsugu Tokunaga, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1977, Ser. No. 802,396
Claims priority, application Japan, Jun. 2, 1976, 51-64968
Int. Cl.[2] H04B 1/10
U.S. Cl. 325—480 **4 Claims**



1. In a combination with an FM demodulator adapted to demodulate an intermittent frequency-modulated carrier wave;

a detector circuit for detecting the presence of said modulated carrier wave;

a low-pass filter for passing only a D.C. variation component contained in the output of said demodulator, said component being due to interruption of said modulated carrier wave;

a delay circuit for delaying the output of said demodulator by a predetermined delay time;

a subtractor circuit for providing a voltage representative of the difference between the outputs of said low-pass filter and said delay circuit; and

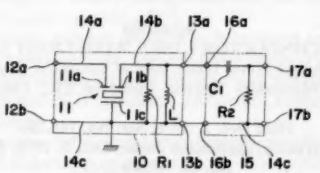
a gate circuit connected to said subtractor circuit to be actuated in response to the output of said detector circuit, wherein the time constant of said low-pass circuit is approximately equal to the sum of the transient response time of said FM demodulator and said predetermined delay time to eliminate said D.C. variation component.

4,144,501

QUADRATURE FM DETECTOR INCLUDING LOW REACTANCE PHASE SHIFTER

Kazuya Togawa, and Kimio Masaie, both of Hakui, Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Feb. 21, 1978, Ser. No. 880,013
Claims priority, application Japan, Feb. 19, 1977, 52/17404
Int. Cl.[2] H03D 3/16
U.S. Cl. 329—118 **7 Claims**



1. A quadrature detector for producing a frequency demodulated signal by the detection of a phase difference between a signal, applied thereto from a limiter, and a signal applied thereto from the limiter through a tank circuit and a phase shift circuit for shifting the second mentioned signal approximatedly 90° in phase, said quadrature detector comprising in combination:

a multi-mode resonator of trapped energy type included in said tank circuit, said resonator having input and output

electrodes laminated on one surface thereof and common electrode element laminated on the other surface thereof;

a capacitor included in said phase shift circuit, said capacitor connected between output and input terminals of the phase shift circuit;

a resistor included in said phase shift circuit, said resistor connected between two output terminals of the phase shift circuit; and

an inductance element coupled to said resonator for facilitating the use of said capacitor having a comparatively high capacitance necessary to prevent said second mentioned signal from being considerably attenuated during its passage through such said capacitor, thereby allowing the phase shift circuit to generate an output signal of high level.

4,144,502

NEGATIVE FEEDBACK AMPLIFIERS OF PWM-TYPE

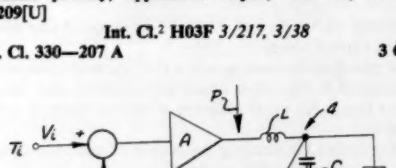
Yuji Ikeda, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1977, Ser. No. 845,651

Claims priority, application Japan, Oct. 30, 1976, 51-146209[U]

Int. Cl.² H03F 3/217, 3/38

U.S. Cl. 330—207 A **3 Claims**



1. In a negative feedback amplifier of a PWM-type comprising a triangular wave generating means for generating a triangular wave of a higher frequency than that of an input signal to be amplified, a voltage comparing means for comparing the triangular wave with a resultant signal of the input signal and a fed-back signal to form a PWM signal, a pulse amplifier means for power amplifying the PWM signal, a low-pass-filter being formed with at least one stage LC-filter for demodulating the amplified PWM signal from the pulse amplifier means to provide the amplified low frequency signal to a load, and a feedback loop for taking out the fed-back signal from a common connection point of an inductor and a capacitor of the LC-filter to add the signal to the input signal, an improvement comprising a resistor means which is connected in series with the capacitor of the LC-filter from which the fed-back signal is taken out, whereby a stable negative feedback operation is performed.

4,144,503

SEMICONDUCTOR LASER WITH LIGHT GUIDE

Kunio Itoh, and Morio Inoue, both of Takatsuki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 2, 1976, Ser. No. 746,750

Claims priority, application Japan, Dec. 5, 1975, 50/145720

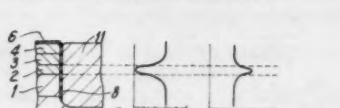
Int. Cl.² H01S 3/19

U.S. Cl. 331—94.5 H **7 Claims**

1. A semiconductor laser light guide comprising:

a laser part which includes an active region also operating as a Fabry-Perot cavity on a monolithic semiconductor wafer; and

at least a light guide part which is of a mixed crystal selected from the group consisting of $GaAs_{1-y}P_y$ and $Ga_{1-z}Al_zAs$ where $0<y<1$ and $0<z<1$, formed by epitaxial growth on said semiconductor wafer, said light guide part having a much higher resistivity than that of the laser part, and being optically coupled to said laser part the values of y and z chosen to provide in said light guide part a predetermined graded-index distribution in which the refractive



index is largest within a plane in said light guide which includes the center of the path of lased light coming out of said active region of the laser.

4,144,504

PLANAR LASER MOUNT

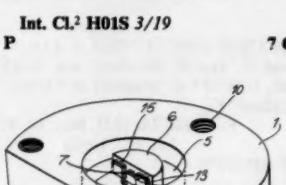
Norman D. Leggett, Hoddesdon, and Richard E. Epworth, Bishops Stortford, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 1, 1977, Ser. No. 783,874

Claims priority, application United Kingdom, May 11, 1976, 19323/76

Int. Cl.² H01S 3/19

U.S. Cl. 331—94.5 P **7 Claims**



1. A laser device, comprising:

an electrically conductive housing having a flat rear surface and a flat front surface extending in a plane parallel with said rear surface;

a central recess formed in said front surface and being partially defined by a base surface;

a slot formed in a side of said housing and extending from the exterior thereof into said recess;

a window formed in said housing and extending from said base surface of said recess to said flat rear surface for providing an opening through said housing;

an electrically conductive pillar mounted within said recess on said base surface and having an upper surface thereof terminating approximate said plane of said housing front surface and having a second surface substantially normal to said housing rear surface and aligned with said window of said housing, said electrically conductive pillar being in electrical connection with said electrically conductive housing for providing a terminal connection for an injection laser;

an injection laser secured to said second surface of said pillar and positioned to have its laser axis aligned substantially normal to said housing rear surface and in alignment with said window;

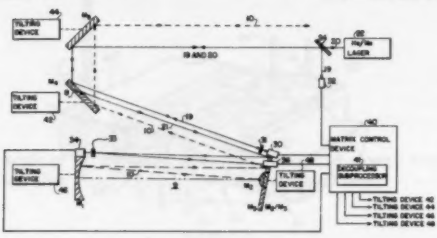
a strip-line for providing another terminal connection for said laser, said strip-line secured in said slot and extending substantially parallel with said base surface from the exterior of said housing into said recess to a bend beyond which it extends substantially parallel with said second surface of said pillar to which said laser is secured; and

means for electrically connecting said strip-line to said laser.

4,144,505
AUTOALIGNMENT SYSTEM FOR LASER WITH UNSTABLE RESONATOR

Albert W. Angelbeck, Glastonbury, Conn.; Stuart N. Mapes, Satellite Beach, Fla., and George R. Wisner, Deep River, Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 25, 1977, Ser. No. 844,690
Int. Cl.[2] H01S 3/13
U.S. Cl. 331—94.5 S **16 Claims**



1. A method of automatically aligning a high power laser having an unstable resonator cavity defined by a first end mirror configuration and a second end mirror configuration and at least first and second turning mirrors; comprising the steps of:

providing a beam of alignment radiation from an external source;

directing the alignment beam along the optical train of said highpower laser;

dividing said alignment beam into first and second alignment beams;

directing said first alignment beam on an optical alignment path defined by a first detector located on said second end mirror configuration, said turning mirrors and a second detector;

directing said second alignment beam along the optical axis of said resonator cavity on an optical alignment path defined by a third detector located on said first end mirror configuration and a fourth detector located on said second end mirror configuration;

detecting any deviation in said first alignment beam and generating corresponding error signals by means of said first and second detectors;

detecting any deviation in said second alignment beam and generating corresponding error signal by means of said third and fourth detectors;

translating said error signals corresponding to deviations in said first and second alignment beams into a set of compensating tilt commands; and

tilting said first and second end mirror configurations and said first and second turning mirrors in response to said tilt commands so as to correct the deviations detected in said first and second alignment beams; thereby automatically aligning said high power laser.

4,144,506
COAXIAL LINE TO DOUBLE RIDGE WAVEGUIDE TRANSITION

John W. McCammon, Redwood City, and George Imokawa, San Jose, both of Calif., assignors to Litton Systems, Inc., San Carlos, Calif.

Filed Sep. 23, 1977, Ser. No. 835,878
Int. Cl.[2] H01P 5/10
U.S. Cl. 333—26 **5 Claims**

1. A coaxial line to ridged rectangular waveguide transition for coupling microwave energy comprising:

(a) a rectangular waveguide section of metal material containing first and second ends, top, bottom and side walls defining a hollow interior, and an end wall at or approximate said first end, longitudinally extending opposed first and second ridges of first and second predetermined length extending from said second end and located on the inner surfaces of the top and bottom walls, respectively, each of said ridges being of a predetermined short height, d_0,

each of said ridges containing an end section of relatively uniform rectanguloid section and a flared section of increasing with outwardly tapered with the latter section located remote from said second end;

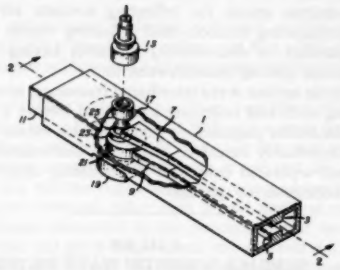
(b) impedance transition means of metal material extending into the waveguide through one of said top and bottom walls, said transition means having a portion protruding within said waveguide interior, said protruding portion having a geometry which includes:

a first right cylindrical portion of radius, r_1, having a first axis and a height, d_1, slightly greater than the height, d_o, of said ridges;

a second right cylindrical portion of radius, r_2, having a second axis and a short height, d_2, located on top of and within the surface defined by said first cylindrical portion;

said second axis displaced from said first axis and said radius, r_2, being less than said radius, r_1;

and with an outer surface portion located most remote from said second waveguide end of said two cylindrical portions being tangent to a common plane orthogonal to the axis of said waveguide section along a common line in said plane;



a third right cylindrical portion having a radius, r_3, a third axis, and a height, d_3, located on top of and within the surface defined by said second cylindrical portion;

with said third axis being coaxial with said second axis and wherein said third radius, r_3, is smaller than said second radius, r_2;

the sum of the heights of said cylindrical portions within said waveguide interior, $d_1+d_2+d_3$, being less than the distance between said top and bottom walls of said waveguide section but greater than the distance between said opposed ridges;

a dielectric member pervious to microwave energy having a cylindrical portion extending into said waveguide section interior from an opposed wall thereof coaxially with said third cylindrical portion and abutting the end thereof;

an elongate rodlike conductor member extending through said dielectric member and into said cylindrical portions for conducting microwave energy into said waveguide section;

said first tapered ridge section containing a concavely cylindrical end periphery located in abutting relation with said first cylindrical portion;

said second tapered ridge section containing an end surface spaced from said third cylindrical portion by a slight distance and being spaced from said dielectric member by a slight distance; and

said dielectric member and said rodlike conductor mem-

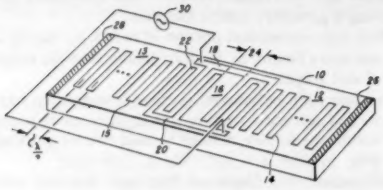
ber having an end geometry and relationship for coupling of a coaxial type connector.

4,144,507

SURFACE ACOUSTIC WAVE RESONATOR INCORPORATING COUPLING TRANSDUCER INTO REFLECTING ARRAYS

William R. Shreve, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 29, 1976, Ser. No. 727,741
Int. Cl.[2] H03H *9/02, 9/26, 9/32, 9/04*
U.S. Cl. 333—191 **22 Claims**



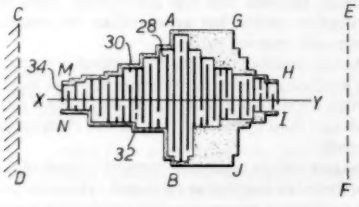
1. An acoustic surface wave resonator device comprising:
substrate means having at least a surface layer of piezoelectric material on which acoustic surface waves may be propagated,
reflecting means defined on the piezoelectric surface of said substrate means for reflecting acoustic surface waves propagating thereon, said reflecting means including a plurality of discontinuity elements having a predetermined spacing therebetween, and
acoustic surface wave interdigital transducer means interacting with said reflecting means and having a plurality of electrodes disposed on said substrate means so as to be periodically extensive with said discontinuity elements and separated from said discontinuity elements by said predetermined spacing.

4,144,508

SURFACE ACOUSTIC WAVE FILTERS

Brian Lewis, Brackley, and John M. Deacon, Northampton, both of England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

Filed Jul. 28, 1977, Ser. No. 820,625
Claims priority, application United Kingdom, Jul. 29, 1976, 31542/76
Int. Cl.[2] H03H *9/04, 9/26, 9/32;* **H01L** *41/10*
U.S. Cl. 333—191 **5 Claims**



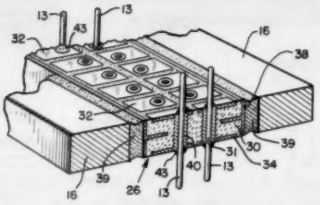
1. A surface acoustic wave filter comprising a plurality of transducers, including at least one weighted transducer having a pattern of interleaved metal fingers formed on a surface of a piezo electric substrate, at least one uniform transducer associated with said one weighted transducer and means for reducing spurious peak signals originating from within the weighted transducer comprising a balancing network associated with said transducers for varying the center of balance of spurious peak signals produced within the weighted transducer such that a substantial reduction of these spurious peak signals is achieved.

4,144,509

FILTER CONNECTOR

Kamal S. Boutros, Downsview, Canada, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Jan. 12, 1977, Ser. No. 758,565
Int. Cl.[2] H03H *7/04, 13/00;* **H01R** *13/66;* **H01G** *4/40*
U.S. Cl. 333—181 **9 Claims**



1. An electrical connector comprising, in combination:
a housing defining an insert-receiving recess;
a dielectric insert member carried within said recess, said dielectric member having a front surface and a rear surface, and including at least one axially extending contact-receiving passageway extending therethrough;
a sleeve-shaped inductance member coaxially disposed within said passageway, said inductance member having a front end exposed on said front surface and a rear end exposed on said rear surface;
a pin contact extending through said inductance member and including a first projecting portion projecting from said front surface, and a second projecting portion projecting from said rear surface, and a body portion within said inductance member;
first and second electrically conductive layers disposed on said front and rear surfaces of said dielectric member, respectively, said dielectric member and said inductance member isolating said first and second electrically conductive layers from direct electrical interengagement with each other;
first and second connecting means disposed exterior to said dielectric member and said conductive layers for electrically connecting said first and second layers to said first and second projecting portions of said contact pin, respectively;
means including a third electrically conductive layer disposed within said dielectric member between said first and second layers for forming in conjunction therewith capacitive elements at respective ends of said body portion of said pin contact; and
grounding means for electrically grounding said third conductive layer to establish in conjunction with said inductance member a pi-network filter element for said pin contact.

4,144,510

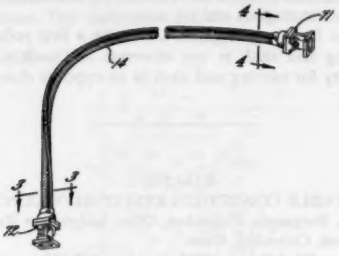
CORRUGATED ELECTRICAL WAVEGUIDE WITH PERMANENT TWIST

Fred Brown, Calumet City, and Anthony D. Vinezeano, Markham, both of Ill., assignors to Andrew Corporation, Orland Park, Ill.

Filed Jun. 29, 1977, Ser. No. 811,053
Int. Cl.[2] H01P *3/12, 3/14*
U.S. Cl. 333—241 **1 Claim**

1. A corrugated elliptical waveguide comprising a single unitary, fluid-impervious, corrugated metallic tube with a substantially elliptical cross section, said corrugated tube being permanently twisted about its longitudinal axis for connecting

two terminals having their E planes out of register with each other, said twist turning the E plane of said waveguide through



an angle of 90° and being uniformly distributed along a length of less than about 12 inches of the corrugated tube.

4,144,511

PUSH-BUTTON MECHANISMS AND EQUIPMENT INCLUDING THEM

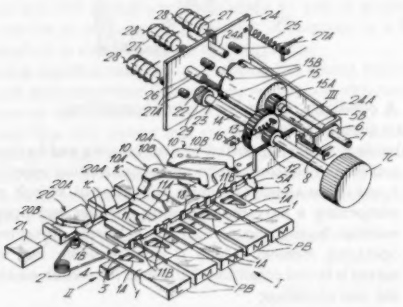
Frederick J. Collings, Hertford, England, assignor to Smiths Industries Limited, London, England

Filed Apr. 21, 1977, Ser. No. 789,584

Claims priority, application United Kingdom, Apr. 21, 1976, 16089/76

Int. Cl.² H03J *5/32*

U.S. Cl. 334—7 **8 Claims**



1. A push-button mechanism comprising a plurality of individually-actuable push-button means, rotatable output means, and means coupling the push-button means to the said output means to rotate the said output means to different angular positions according to which of the push-button means is actuated, said coupling means comprising a first member mounted for linear displacement, means coupling the said first member to said output means to rotate said output means to a position dependent on the extent of linear displacement of said first member, and a plurality of pivotally mounted levers associated respectively with said push-button means, each said lever being arranged for pivotal movement about an axis fixed relative to said mechanism upon actuation of its respective push-button means, the extent of said pivotal movement being dependent on the extent of actuation of said respective push-button means, and each said lever having an arm for engaging said first member so that pivotal movement of said lever is communicated to said first member to effect linear displacement thereof the extent of which is dependent upon the extent of said pivotal movement, so that actuation of said push-button means is thereby communicated to said first member through pivotal movement of the subject lever, and so that the extent of displacement of said first member is dependent upon which of the push-button means is so actuated.

4,144,512

AFC VOLTAGE SUPERIMPOSING CIRCUIT FOR ELECTRONIC TUNER

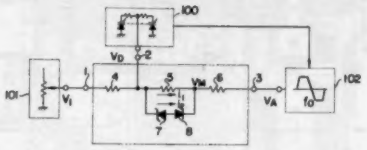
Yoshiharu Umemura, and Shigeo Matsuura, both of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 17, 1977, Ser. No. 759,860

Claims priority, application Japan, Jan. 19, 1976, 51-4125

Int. Cl.² H03J *3/18*

U.S. Cl. 334—15 **3 Claims**



1. An AFC voltage superimposing circuit for an electronic tuner using a plurality of varactors as a tuning element, comprising:

(a) a first terminal connected to a circuit for generating a tuning voltage;

(b) a second terminal connected to a tuning circuit using a plurality of varactors;

(c) a third terminal connected to an AFC voltage generating circuit;

(d) a first resistor connected between said first and second terminals;

(e) a first series-circuit including a second, a third and a fourth resistor connected in series, said first series-circuit being connected between said second and third terminals; and

(f) a bypass circuit including a voltage regulating diode, a first and a second diode, and a fifth and a sixth resistor, said voltage regulating diode and said first and second diodes being connected in common at one end, the other end of said voltage regulating diode being connected to said second terminal, other ends of said first and second diodes being connected to the junction points between said second and third resistors and between said third and fourth resistors through one of said fifth and sixth resistors respectively, said bypass circuit having the characteristic of permitting a current to flow in one direction only, said voltage regulating diode and said first and second diodes being disposed in such polarity that when said tuning voltage exceeds a predetermined level, said voltage regulating diode and said first and second diodes come into a conducting state, thereby permitting a current to flow from said first terminal to said third terminal and thus increasing an AFC voltage variation superimposed on said tuning voltage, whereby an interchannel deviation of AFC sensitivity may be reduced.

4,144,513

ANTI-REBOUND LATCH FOR CURRENT LIMITING SWITCHES

Howard R. Shaffer, Westminster; G. Erich Heberlein, Jr., Sykesville, and Norman P. Perkins, Westminster, all of Md., assignors to Gould Inc., Rolling Meadows, Ill.

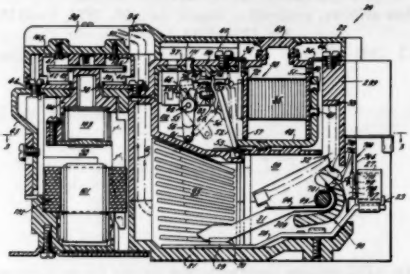
Filed Aug. 18, 1977, Ser. No. 825,584

Int. Cl.² H01H *77/00*

U.S. Cl. 335—46 **8 Claims**

1. A switching device including a stationary contact, a movable contact, a movable contact arm carrying said movable contact at one end thereof, a carrier to which said arm is mounted, means mounting said carrier for movement between first and second positions wherein said contacts are normally closed and opened, respectively, means mounting said arm on said carrier for relative movement with respect thereto between third and fourth positions while said carrier is in said first position, said contacts being engaged when said carrier is

in said first position and said arm is in said third position, biasing means urging said arm toward said third position, latch means to prevent rebound of said arm toward said third position after predetermined movement thereof toward said fourth position as a result of electrodynamic blowoff forces, said latch



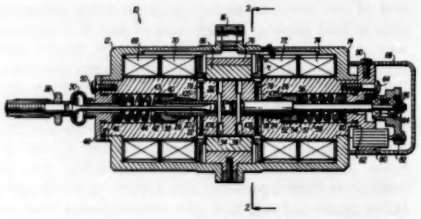
means including a latch member biased toward normal latching position to engage a latching surface on said arm at its other end to hold said arm in said fourth position, means on said carrier engageable with said latch member to disengage the latter from said latching surface as said carrier moves from said second position toward said first position.

4,144,514

LINEAR MOTION, ELECTROMAGNETIC FORCE MOTOR

John E. Rinde, Endicott, and Richard M. Perry, Johnson City, both of N.Y., assignors to General Electric Company, Utica, N.Y.

Filed Nov. 3, 1976, Ser. No. 738,207
Int. Cl.[2] H01F *7/08*
U.S. Cl. 335—229 **4 Claims**



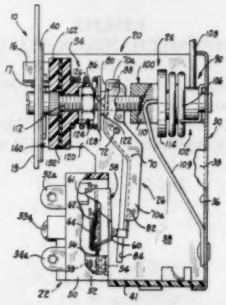
1. An electromagnetic motor for producing a linear movement in either of two opposite directions comprising:
(a) a housing of electromagnetically conducting material;
(b) a non-magnetic shaft mounted in said housing for linear movement in either of two opposite directions;
(c) an annular armature of magnetically conducting material connected to said shaft;
(d) spring means comprising a first spring member and a second spring member, said first spring member being armature on one side of said armaure and said second spring member being mounted on the other side of said armature, each of said spring members have one end engaging said shaft and the other end engaging said housing;
(e) means for limiting movement of said armature in both directions, said means comprising a first member positioned between one side of said armature and said housing and a second member positioned between the opposite side of said armature and said housing;
(f) an annular samarium-cobalt permanent magnet mounted in said housing and extending around the periphery of said armature and forming a radial air gap between said magnet and said armature;
(g) said magnet comprising a plurality of radially abutting segments;
(h) a plurality of electrical coils fixedly mounted in said housing with at least one coil mounted on each side of said permanent magnet; and
(i) means for energizing said coils with a first polarity for moving said shaft in one direction and with a second polarity for moving said shaft in an opposite direction.

4,144,515

ADJUSTABLE CONDITION RESPONSIVE CONTROL

Richard L. Bergmann, Columbus, Ohio, assignor to Ranco Incorporated, Columbus, Ohio

Filed Feb. 9, 1977, Ser. No. 767,182
Int. Cl.[2] H01H *37/12*
U.S. Cl. 337—319 **19 Claims**

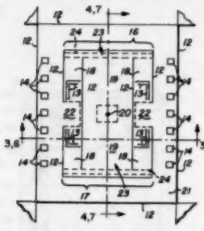


1. A condition responsive control comprising:
(a) a support housing;
(b) switch means supported by said housing and having first and second control conditions for controlling operation of a condition-altering device, said control switch means comprising a movable operating member and operating member biasing means exerting a biasing force on said operating member which is greater when said switch means is in one condition than when the switch means is in the one condition;
(c) condition responsive actuator means comprising an actuating member supported for movement relative to said housing in response to sensed changes in conditions;
(d) a lever system associated with said housing said housing including means supporting said lever system for pivotal movement and constraining said lever system against translational movement relative to said housing, said lever system coacting between said switch means and said actuator means for effecting operation of said switch means between its said conditions as a result of movement of said actuating member; and,
(e) said actuator means further including lost motion means between said actuating member and said lever system comprising:
(i) a first abutment movable with said actuating member for enabling motion of said lever system;
(ii) a second abutment movable with said actuator member for enabling motion of said lever system;
(iii) biasing means coacting with said lever system and reacting in opposition to said switch operating member biasing means for enabling movement of said lever system by said first abutment member when said switch means is in one condition and by said second abutment member when said switch means is in said other condition.

4,144,516
SOLID STATE TRANSDUCER AND METHOD OF MAKING SAME

Harry E. Aine, Two Palo Alto Sq., Palo Alto, Calif. 94304

Continuation-in-part of Ser. No. 671,680, Mar. 29, 1976, abandoned. This application Jul. 21, 1977, Ser. No. 817,556
Int. Cl.[2] G01L 1/22
U.S. Cl. 338—2 15 Claims



1. In a method for fabricating a solid state transducer of the type having a leaf spring structure supported from a support structure in axially spaced relation along an axis of sensitivity, the steps of:

forming a leaf spring structure by recessing through a major face of first and second wafer portions in accordance with a predetermined leaf spring pattern to define first and second leaf spring structures having deflectable portions supported from respective first and second support structures which allow deflection of said deflectable portions of said leaf spring structures along an axis of sensitivity relative to said support structures in response to a force applied to said leaf spring structures; and

joining together said first and second leaf spring structures and said respective first and second support structures in spaced apart relation along an axis of sensitivity so that said first and second leaf spring structures are deflected along the axis of sensitivity by like amounts relative to said respective first and second support structures in response to deflection of either of said first and second spring structures along said axis of sensitivity.

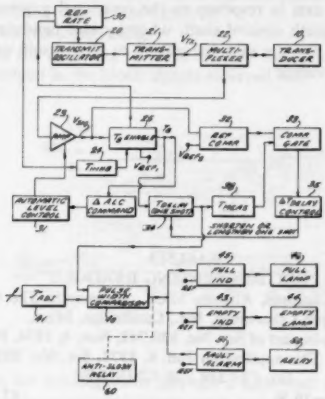
11. The product made by the method of claim 1.

4,144,517
SINGLE TRANSDUCER LIQUID LEVEL DETECTOR

Joseph Baumoel, 107 Columbia Dr., Jericho, Long Island, N.Y. 11753

Filed Aug. 5, 1977, Ser. No. 822,199
Int. Cl.[2] G01F 23/28
U.S. Cl. 340—1 L 20 Claims

1. A monitor for a fluid receiving container for determining a fluid condition within the container without penetrating the container wall; said monitor comprising a transducer means operable to be pressed against the outer surface of said container at a given location on said container, a transducer operating circuit for producing an ultrasonic pulse from said transducer means which travels longitudinally into the wall of said container at said given location, and a transducer signal processing circuit for processing the output signal produced by said transducer means in response to the reception thereby of a return multiply reflected ultrasonic signal within the wall of said container at said given location; said signal processing circuit including amplitude decay measuring means for measuring the rate of decay of the amplitude of said return signal

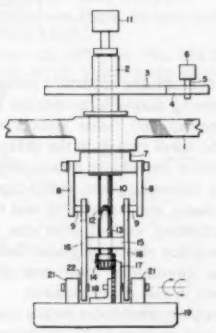


and output circuit means for producing an output signal in response to the measured rate of decay of said return signal.

4,144,518
STABILIZED-TRANSDUCER DRIVING DEVICE FOR UNDERWATER ULTRASONIC DETECTION SYSTEM

Kiyomi Minohara, and Koichi Sonoda, both of Nishinomiya, Japan, assignors to Furuno Electric Co., Ltd., Nagasaki, Japan

Filed Sep. 13, 1977, Ser. No. 832,851
Claims priority, application Japan, Mar. 10, 1977, 52-26650
Int. Cl.[2] H04R 1/32; G01S 9/66
U.S. Cl. 340—3 PS 3 Claims



1. A stabilized-transducer driving device suitable for underwater ultrasonic detection system comprising

(a) a platform having an opening and adapted to be fixedly connected to a ship so as normally to be maintained in parallel with the horizontal plane,

(b) a hollow azimuth control shaft which is rigidly mounted on said platform extending through the opening thereof,

(c) a tilt control shaft which is rotatably mounted on said azimuth control shaft extending through the hollow thereof,

(d) a tilt drive shaft which is pendulously suspended from said tilt control shaft by a universal joint,

(e) a transducer which is operably connected to said tilt drive shaft,

(f) tilt drive means for varying the tilt angle of said transducer with respect to the vertical axis of said tilt drive

shaft in response to the rotational movement of said tilt drive shaft, and

(g) scan drive means for rotating said transducer about the vertical axis in response to the rotational movement of said azimuth control shaft, whereby said pendulous suspension permits said transducer to align itself with the gravity vector.

4,144,519

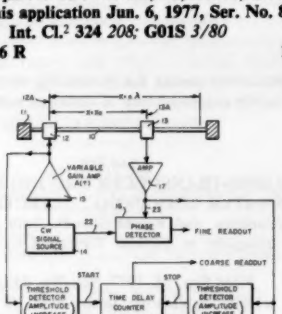
POSITION SENSING READOUT

Jacques R. Chamuel, Allston, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 520,742, Nov. 4, 1974, Pat. No. 4,035,762. This application Jun. 6, 1977, Ser. No. 803,807

Int. Cl.[2] 324 *208;* G01S *3/80*

U.S. Cl. 340—16 R **17 Claims**



1. A position determining apparatus comprising at least one delay element having magnetic properties and capable of establishing electromagnetic fields associated with travelling continuous elastic wave signals in the delay element;

at least one driver transducer means coupled to said delay element at a reference position and capable of producing transverse elastic wave signals in said delay element;

means for activating said at least one driver transducer means to produce electromagnetic fields associated with at least one continuous transverse elastic wave signal which travels in said delay element;

at least one receiver transducer means coupled to said delay element at said position to be determined relative to said reference position, said at least one receiver transducer means detecting the presence of electromagnetic fields associated with said travelling continuous transverse elastic wave signal as it travels past said position to produce a detected continuous transverse wave signal;

means responsive to said detected continuous wave signal and to said activated continuous wave input signal for determining the position of said at least one receiver transducer relative to said reference position, said position determining means including

means for comparing the phase of said detected continuous transverse wave signal as detected at said position to be determined with the phase of said activated continuous transverse wave input signal at said reference position; and

means for substantially reducing reflections of travelling elastic waves in said delay element.

4,144,520

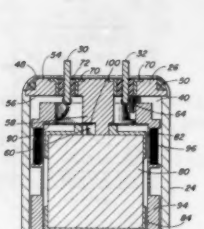
GEOPHONE HAVING ELECTROMAGNETIC DAMPING MEANS

William O. McNeel, Houston, Tex., assignor to Geo Space Corporation, Houston, Tex.

Filed Feb. 3, 1977, Ser. No. 765,272

Int. Cl.[2] G01V *1/16*

U.S. Cl. 340—17 SP **7 Claims**



1. A geophone for sensing vibrations comprising

a metal housing having a hollowed-out central area and means defining a closed end including a centered recessed area and an opened end;

a header having a top surface and a bottom surface, said header being positioned in the opened end of the housing with the bottom surface interior to the housing, said bottom surface having an elongated spacing member extending from the center thereof and terminating in a slotted tip and a pair of elongated ribs located at the periphery of the bottom surface and extending towards and in radial alignment with the center of the spacing member and each other, said header having a pair of insulated terminals extending therethrough into the interior of the housing;

a permanent magnet positioned in a spaced relationship within the hollowed-out central area of the housing and extending axially therethrough from the tip of the spacing member to the closed end of the housing;

an annular shaped magnetic insulator support member positioned within the centered recessed area of the closed end of the housing and said permanent magnet;

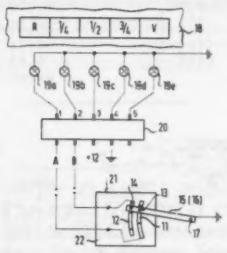
a spring assembly formed of a pair of disc shaped vertically deflectable torsion springs, one of which is coupled to the slotted tip and positioned between the spacing member and permanent magnet and positioned between the annular shaped member and permanent magnet; and

a coilform fabricated from an electrically conductive metal positioned in the space within the housing and enclosing said permanent magnet, said coilform engaging and cooperating with said pair of springs for movement in a direction substantially parallel to the axis of said permanent magnet, said coilform including a surface contiguous said housing and having at one end thereof a pair of spaced parallel axially aligned circumferentially extending walls defining a passageway which encloses a wire coil adapted to be electrically connected to the pair of terminals and having at the other end thereof a solid section formed of an electrically conductive metal positioned in the periphery of the coilform on the same side as said passageway and having a radial thickness substantially equal to the thickness of said extending walls; said one end having a pair of slots formed at the edge thereof, positioned to movably engage and cooperate with said pair of elongated ribs to limit rotational movement of the coilform.

4,144,521
SIGNAL GENERATOR FOR A FLUID-LEVEL INDICATOR

Gunter Lehnhert, Russelsheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 9, 1978, Ser. No. 867,708
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1977, 2701572
Int. Cl.² G08B *21/00*
U.S. Cl. 340—59 **5 Claims**



1. A signal generator for a fluid-level indicator in a motor vehicle to monitor the fuel level in a fuel tank of said vehicle, said vehicle including an instrument panel having mounted thereon an illuminable display device, said display device comprising a plurality of illuminable display panels, each of which carries a visible inscription and is illuminable by a respective electrically-energizable light means, said fluid-level indicator including float means suspended in the fuel of said fuel tank, lever transmission means connected to said float means, and a pivot connected to said lever transmission means in such a manner that movement of the float means in response to changes in the fuel level produces corresponding pivotal movement of said pivot, said signal generator comprising digital binary coding means mechanically connectable to said pivot so as to transform the pivotal movement thereof into corresponding digital binary coded signals, and an integrated switching circuit for receiving said corresponding digital binary coded signals as inputs thereto, said switching circuit having a plurality of outputs therefrom, each one of which is connectable to a respective one of said respective energizable light means, each one of said outputs being enabled in sequence by the serial changes in the digital binary coded signals produced by the pivotal movement of said pivot through a predetermined angle corresponding to the movement of the float means produced by the change in fuel level between a predetermined minimum level and a predetermined maximum level.

4,144,522
ELECTRO-CONTROL SYSTEM FOR DATA TRANSMISSION

Satoshi Kageyama, and Kunihiko Sekiya, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Feb. 24, 1977, Ser. No. 771,445
Claims priority, application Japan, Feb. 25, 1976, 51-18806
Int. Cl.² G08C *25/02*
U.S. Cl. 340—146.1 BA **5 Claims**

1. An error control system for transmission of data between a transmitter and a receiver,

the transmitter comprising:

means for transmitting successively a series of block signals each formed of data, a block number code and an error-detecting code to the receiver through a forward channel;

means for detecting a negative acknowledgement including a block number designation designating a block signal in which an error is detected at the receiver

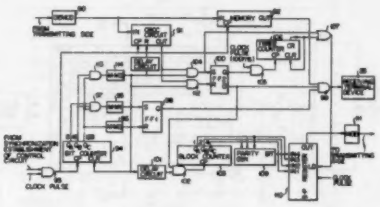
means for detecting a false negative acknowledgement sent forth from the receiver;

means for inverting all bits of a data signal or an error detecting code being transmitted upon detection of the negative acknowledgement;

means for transmitting the inverted data signal or the error detecting code to the receiver;

the receiver comprising:

means for detecting an error from at least the data signal included in the block signals received and

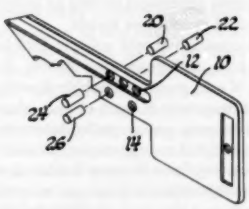


means for sending forth through a backward channel the negative acknowledgement upon detection of an error to cause the transmitter to again deliver block signals, the first one of which is a block signal corresponding to the block signal found erroneous.

4,144,523
DIGITAL KEY SYSTEM

Michael Kaplit, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 23, 1977, Ser. No. 854,250
Int. Cl.² E05B *49/00*; H04Q *3/00*; E05H *47/00*
U.S. Cl. 340—149 R **3 Claims**



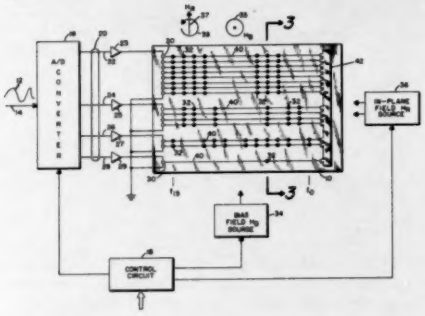
1. In a security system including a key having a digital code, key reader means for receiving said key and for generating a digital signal as a result of movement of said key relative to said key reader, and comparator means for establishing an enable condition when the code signal generated by insertion of said key in said key reader matches a stored code, the improvement comprising programmable memory means for supplying said stored code to said comparator means, write circuit means for loading the code in said memory, gate means connecting said write circuit means with said code reader, said write circuit means causing the code to be loaded in said memory in response to the code signal generated upon withdrawal of said key from said code reader, said gate means normally passing said code signal to said write circuit means but adapted to inhibit passage of said code signal upon the completion of the loading of said code in said memory.

4,144,524

MAGNETO-OPTIC BUBBLE DOMAIN HISTOGRAPH INCORPORATING GRAY SCALE WEIGHTING

David L. Fleming, Edina, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 2, 1977, Ser. No. 773,444
Int. Cl.[2] G01D *7/00;* G11C *11/14*
U.S. Cl. 340—754 5 Claims



1. A bubble domain histograph, comprising:

analog-to-digital converter means for receiving an analog signal and converting each of a plurality of sampled signal amplitudes, at a sampling frequency F, to its digital equivalent of M bits;

M output line means coupled to said analog-to-digital converter means for receiving said digital equivalent of each of said analog signal sample amplitudes as energized selected ones of said M output line means;

a bubble domain memory plane comprising:

M horizontally aligned groups of bubble domain propagation paths;

M vertically aligned groups of column forming bubble domain generators, each bubble domain generator coupled to only an associated separate one of said groups of bubble domain propagation paths;

means for coupling each of said groups of column forming bubble domain generators to only an associated separate one of said M output line means;

control means controlling said column forming bubble domain generators and generating bubble domains in selected ones of said groups of bubble domain propagation paths at said frequency F, each of said selected groups of bubble domain propagation paths determined by the respectively associated energized ones of said M output line means, for moving each discrete bubble domain along its associated bubble domain propagation path at said frequency F to form a real-time display of said analog signal.

4,144,525

CASCADABLE ANALOG TO DIGITAL CONVERTER

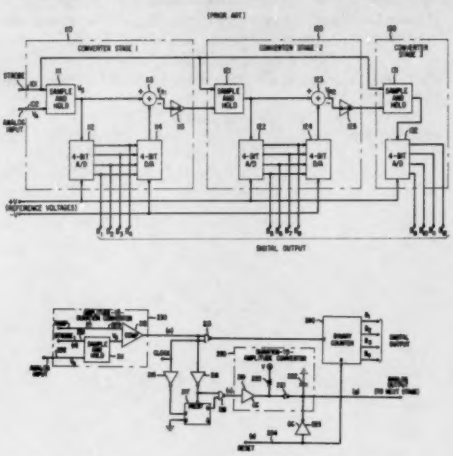
John F. O'Neill, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 21, 1977, Ser. No. 844,229
Int. Cl.[2] H03K *13/20*
U.S. Cl. 340—347 AD 9 Claims

1. A circuit for converting an analog signal level into a digital approximation and a remainder signal, said remainder signal being a measure of the error between the analog signal level and the digital approximation, including means for converting the analog signal level into a duration modulated signal and means for counting discrete events of a timing signal during the duration of said duration modulated signal,

characterized by:

means responsive to an interval between the termination of the duration modulated signal and a timing signal discrete



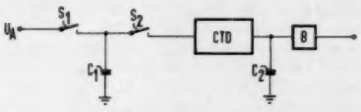
event which is adjacent in time to said termination, for generating the remainder signal.

4,144,526

CIRCUIT ARRANGEMENT AND OPERATING PROCESS FOR CONVERTING AN ANALOGUE SIGNAL INTO A DIGITAL SIGNAL

Gottfried Wotruba, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 21, 1977, Ser. No. 761,005
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1976, 2602315
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 AD 6 Claims



1. A circuit arrangement for converting an analogue signal into a digital signal, said circuit arrangement comprising:

(a) a first capacitance;

(b) a second capacitance which is smaller than the first capacitance;

(c) a first device means connected between the first and second capacitances for providing a stepped exchange of charge between the first and second capacities;

(d) a second device means for bringing the second capacitance to a given charge state;

(e) an evaluation device means for evaluating the charge state of the second capacitance;

(f) a counting device means for counting each stepped exchange of charge to provide said digital signal;

(g) said first device means for stepped exchange of charge comprising a charge coupled device (CCD) means for transferring accurately controlled and substantially equal amounts of charge for the stepped exchanges substantially independent of the charge on the first capacitance;

(h) said CCD means comprising a semiconductor substrate of a first conductivity type which is provided with a substrate terminal, an insulating layer arranged on the semiconductor substrate, at least four electrodes arranged

in series as a row of electrodes comprising electrically conductive material arranged on said insulating layer, a first zone of second conductivity type in the semiconductor substrate at one end of the row of electrodes, and a second doped zone of second conductivity type at the other end of the row of electrodes; and

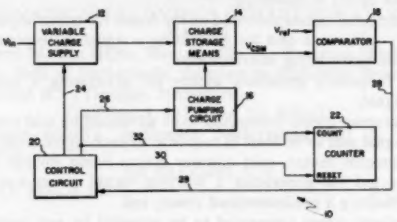
(i) said second device means comprising an MIS field effect transistor whose source zone is said second doped zone and whose drain zone is a third doped zone of second conductivity type in the semiconductor substrate, a fifth electrode on said insulating layer being provided between the second and third doped zones.

4,144,527

DUAL-SLOPE ANALOG TO DIGITAL CONVERTER

Walter J. Butler, and Charles M. Puckette, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 18, 1977, Ser. No. 825,530
Int. Cl.[2] H03K *13/20*
U.S. Cl. 340—347 AD **16 Claims**



1. An analog to digital converter comprising:

means for storing charge;

first means for transferring in succession a first plurality of discrete packets of charge to said charge storage means;

second means for transferring in succession a second plurality of discrete packets of charge from said charge storage means;

each of said first plurality of discrete packets of charge having a magnitude proportional to the magnitude of an analog signal to be converted, each of said second plurality of discrete packets of charge having a single and essentially constant magnitude;

control means including a single comparator for causing said first means to supply said first successive plurality of charge packets to said charge storage means during a first portion of a conversion cycle wherein the voltage across said charge storage means changes from a predetermined first value to a second value, said control means also for causing said second means to remove from said charge storage means said second successive plurality of charge packets during a second portion of said conversion cycle wherein the voltage across said charge storage means changes from said second value to said predetermined first value in steps of essentially equal amplitude; and

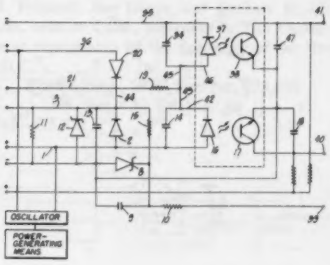
means for generating a digital signal which is proportional to the ratio between the number of said first charge packets required to change the voltage across said charge storage means from said first value to said second value and the number of said second charge packets required to change the voltage across said charge storage means from said second value to said first value.

4,144,528

ALARM SYSTEM

Robert D. Johnson, Sr., Newport Beach, Calif., assignor to CompAlarm Systems Co., Laguna Beach, Calif.

Filed Dec. 29, 1976, Ser. No. 755,339
Int. Cl.[2] G08B *26/00*
U.S. Cl. 340—500 **12 Claims**



1. An alarm system comprising:

a central system including power-generating means and alarm-detecting means, and

at least one alarm-producing system remote from and electrically connected to said central system by a single pair of conductors comprising a first conductor and a second conductor, said alarm-producing system also comprising first switch means, second switch means and third switch means,

said central power-generating means including means for alternately impressing a first predetermined DC voltage simultaneously on the first and the second conductor of said pair of conductors, interrupting voltage entirely, and impressing a second predetermined DC voltage only on said first conductor of said pair of conductors,

said alarm-producing system comprising, means electrically connected to said first conductor for maintaining at least a minimum voltage on said first conductor when no voltage is impressed on said first conductor, and discharge means including said first switch means for electrically connecting to ground the said means for maintaining at least a predetermined voltage on the first conductor,

means for electrically connecting the first conductor to the second conductor of said pair of conductors upon closing of said second switch means between them to permit current flow from said central system through said first conductor, said second switch means and said second conductor to said central system, and

means for electrically connecting the second of said pair of conductors to ground upon closing of said third switch means to permit current flow from said central system through said second conductor to ground at the alarm-producing location.

4,144,529

REMOTELY RESPONSIVE MOTION DETECTOR

George B. Miller, 11621 Kensington, Rossmore, Calif. 90720, and Jack K. Denapole, Costa Mesa, Calif., assignors to George B. Miller, Rossmore, Calif.

Filed May 20, 1977, Ser. No. 798,791
Int. Cl.[2] G08B *13/26*
U.S. Cl. 340—562 **5 Claims**

5. A security device adapted to monitor a secured area for the presence of an intruder comprising:

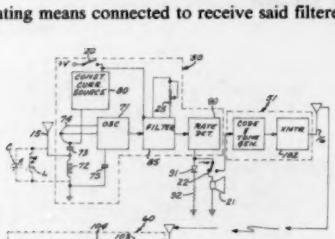
an oscillator including a tank circuit coupled to respond to the capacitive and inductive field changes associated with said intruder, said oscillator providing amplitude changes in the output signal of said oscillator in response to said capacitive and inductive field changes associated with said intruder;

bandpass filter means connected to receive said output signal from said oscillator means said bandpass filter means being conformed to produce a filtered signal corresponding to the frequency components of said output signal which are in the frequency domain of the field changes of said intruder;

differentiating means connected to receive said filtered signal for producing a switching signal when the rate of change of said filtered signal exceeds a predetermined level;

transmitting means connected to be rendered operative by said switching signal for producing a radio signal upon the receipt of said switching signal; and

receiving means conformed to respond to said radio signal for producing an audio signal indicative thereof.

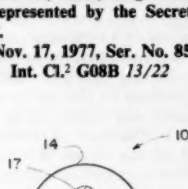


4,144,530

COMBINED INTRUSION SENSOR LINE

John T. Redfern, La Jolla, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 17, 1977, Ser. No. 852,265
Int. Cl.[2] G08B *13/22*
U.S. Cl. 340—566 **5 Claims**



1. An apparatus for sensing mechanical vibrations representative of an intruder and feeding representative signals between signal processing modules;

means for generating electrical signals in response to the mechanical vibrations caused by the intruder;

means disposed adjacent the generating means for providing electrical power and electrical timing pulses to the signal processing modules;

means disposed adjacent the generating means and the electrical power and timing pulse providing means for transmitting optical signals representative of the generated electrical signals; and

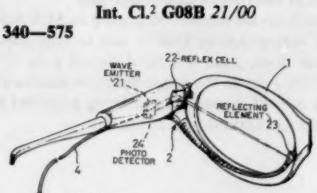
means disposed about the generating means, the electrical power providing means and the optical signal transmitting means for encasing them.

4,144,531

DROWSINESS DETECTING APPARATUS

Henricus J. Anbergen, 9, rue des Espagnols, Arlon, Belgium

Filed Oct. 12, 1977, Ser. No. 841,417
Claims priority, application Luxembourg, Oct. 12, 1976, 75977
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—575 **2 Claims**



1. A safety apparatus for detecting an individual becoming drowsy comprising:

(a) a frame similar to an eyeglass frame;

(b) wave emitter means mounted on the frame for emitting a wave along a path directed to pass close to the individual's eyeball without impinging the latter when the frame is carried on the nose of the individual like an eyeglass frame such that said wave is interrupted by the eyelashes when the eyelid is quivering;

(c) detector means mounted on the frame for being impinged by said wave and for generating a signal in response to said wave being interrupted;

(d) frequency generator means for generating a control signal;

(e) counter means connected to be advanced by said control signal and to be reset in response to each signal from said detector means, said counter means being further connected for generating a warning signal in response to reaching a predetermined count; and

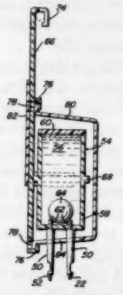
(f) alarm means connected to be actuated by said warning signal from the counter.

4,144,532

THAW ALARM FOR FOOD FREEZER

Herman L. Boyd, P.O. Box 9, Savannah, Tenn. 38372

Continuation-in-part of Ser. No. 685,170, May 11, 1976, abandoned. This application Aug. 9, 1977, Ser. No. 823,207
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—585 **6 Claims**



1. Apparatus for providing a sensorially perceptible indication of the attainment of an undesirable thermal condition within a freezer, comprising:

alarm means for signalling the existence of a predetermined temperature within the freezer, the alarm means being disposed externally of the freezer;

thermally responsive means for responding physically to a change in temperature within the freezer comprising a sealed tubular member having a congealable material disposed therewithin, and an electrically conductive member formed into a sphere freely displaceable within the tubular member when the congealable material is in the liquid state;

circuit means electrically connecting the alarm means and the thermally responsive means for completing an electrical circuit therebetween on attainment of an undesirable thermal condition within the freezer;

electrically conductive leads disposed in one end of the tubular member, electrically conductive ends of the lead members extending into the interior of said tubular member and being spaced apart, contact between the electrically conductive member and the ends of the leads completing the circuit means to activate the alarm means;

a mounting plate; and,

tab members formed on the mounting plate, the tab members forming vertically spaced concentric arcuate surfaces with each said surface defining a portion of a circle of a diameter slightly greater than the diameter of the tubular member to allow receipt of the tubular member within each said arcuate surface, the tubular member having an annular flange receivable between the vertically spaced arcuate surfaces to removably mount the tubular member on the mounting plate.

4,144,533

AUTOMATIC GAIN CONTROL CIRCUIT FOR A PULSED RADAR

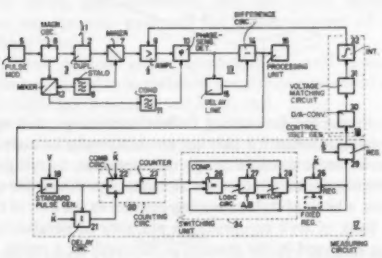
Herman M. Van Hijfte, Hengelo, and Jan Bergman, Haaksbergen, both of Netherlands, assignors to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed Sep. 1, 1977, Ser. No. 829,621

Claims priority, application Netherlands, Sep. 6, 1976, 7609865

Int. Cl.[2] G01S 7/34

U.S. Cl. 343—7 AG **9 Claims**



1. An automatic gain control circuit for an IF amplifier used in a pulsed radar receiver, said automatic gain control circuit comprising a noise measuring circuit for determining the minimum value of a number of average noise levels over corresponding time intervals of given duration within the length of time for the range-independent RF signal amplification in the pulse repetition period, said noise measuring circuit including a counting circuit for counting direct-supplied video pulses which exceed a fixed value and replicas of said video pulses supplied through a delay line to generate a count value corresponding to the number of supplied direct pulses decreased by the number of supplied replica pulses, a first register for storing a count value, a switching unit coupled to said counting circuit and said first register, said switching unit being operative, upon application of both the count value of the counting circuit and the count value stored in the first register, to pass the smaller of the two count values for writing into the first register at the end of a time interval K to be fixed by two consecutive clock pulses within a period lying in said length of time and a second register connected to the first register for storing at the end of each pulse repetition period the count value stored in the first register as said minimum value, and a voltage generator for generating an IF amplifier control voltage derived from said minimum value.

4,144,534

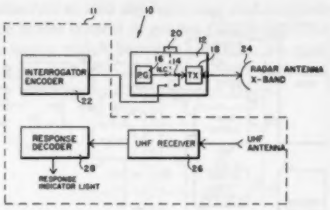
BATTLEFIELD IFF SYSTEM

Michael J. Prickett, San Diego, and Bernarr H. Humpherys, Escondido, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 1, 1975, Ser. No. 573,699

Int. Cl.[2] G01S 9/56

U.S. Cl. 343—6.5 LC **8 Claims**



8. An interrogator comprising:

a surveillance radar device including an internal modulating timing pulse generator and a radar carrier frequency transmitter for outputting a modulated radar signal;

an interrogator encoder means for coding said radar signal;

switch means for selectively connecting said interrogator encoder means to said radar carrier frequency transmitter and for disconnecting said internal modulating timing pulse generator from said carrier frequency transmitter whereby actuation of said switch means results in a coded radar signal.

4,144,535

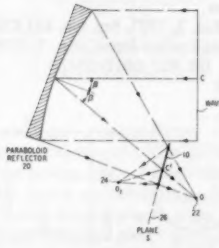
METHOD AND APPARATUS FOR SUBSTANTIALLY REDUCING CROSS POLARIZED RADIATION IN OFFSET REFLECTOR ANTENNAS

Corrado Dragone, Little Silver, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 22, 1977, Ser. No. 770,390

Int. Cl.[2] H01Q 11/10, 15/24

U.S. Cl. 343—756 **12 Claims**



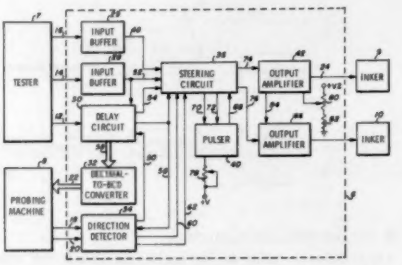
5. A polarization grid for disposition between an offset curved main focusing reflector and a first focal point thereof said grid being capable of passing therethrough electromagnetic radiation polarized in a first orthogonal direction between the main reflector and the first focal point and reflecting electromagnetic radiation polarized in a second orthogonal direction between the main reflector and a second focal point while concurrently introducing cross-polarization components which substantially cancel the cross-polarization components

introduced by the offset main reflector, the grid comprising a plurality of nonparallel spaced-apart elements disposed along paths derived from a set of hyperbolae, and means capable of structurally maintaining said elements along said paths derived from the set of hyperbolae.

4,144,536
INKER NETWORK FOR PROBING MACHINE

Frank J. Ardezzone, Santa Clara, and Arthur P. Verhoeven, Mountain View, both of Calif., assignors to Probe-Rite, Inc., Santa Clara, Calif.

Filed Nov. 21, 1977, Ser. No. 853,340
Int. Cl.[2] G01D *15/16*
U.S. Cl. 346—33 F **11 Claims**



1. A testing system for individually testing each circuit on a semiconductor wafer and for marking those circuits which fail the test, comprising:

a tester for testing a circuit on the wafer, said tester being responsive to a first predetermined condition of the tested circuit and operative to generate a first ink command signal;

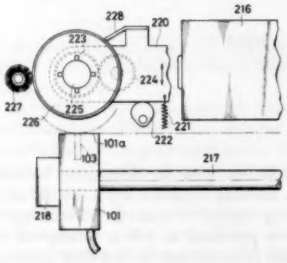
an inker control network responsive to each said first ink command signal and operative to generate a first inker driving signal having two pulses; and

a first inker responsive to each pulse of said first inker driving signal and operative to mark the tested circuit by depositing a predetermined quantity of ink thereon.

4,144,537
METHOD AND APPARATUS FOR CAPPING A NOZZLE OF INK JET RECORDING DEVICE

Yoshiaki Kimura; Yoshio Takeuchi; Mikio Yamada, all of Hachioji; Taneji Morishita, Hino, and Tatsuo Yajima, Kowagoe, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1977, Ser. No. 802,676
Claims priority, application Japan, Jun. 7, 1976, 51-66893
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—140 R **16 Claims**



1. A method of capping a nozzle in a face of a printing head of an ink jet recording apparatus in which ink droplets are ejected to a recording medium from the nozzle communicating with a fluid chamber by suddenly reducing the volume of fluid in said chamber responsive to electrical control signals, which comprises the steps of:

(a) providing a capping means having a capping surface larger in area than the nozzle of the head at a position outside said recording medium;

(b) moving said printing head to the position where said capping means is provided when recording is not performed;

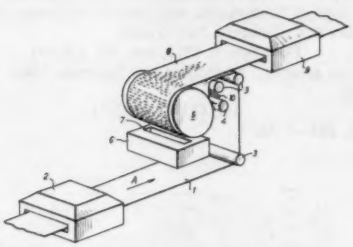
(c) positioning the capping surface relative to said head face to provide a different portion in position for contacting the nozzle from that which was used in the last capping operation; and

(d) bringing said capping means and the nozzle of said printing head into contact with each other to thereby cap the nozzle of said printing head.

4,144,538
METHOD AND APPARATUS FOR COATING FUSIBLE INTERLININGS

Frank Chapman, Pinner, and David Holt, Cambridge, both of England, assignors to Staflex International Limited, London, England

Filed Mar. 16, 1977, Ser. No. 778,064
Claims priority, application United Kingdom, Mar. 19, 1976, 11294/76
Int. Cl.[2] G03G *17/00*; B05B *5/02*
U.S. Cl. 346—153 **13 Claims**

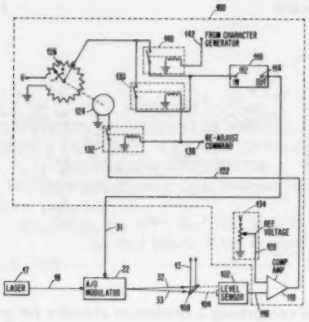


1. Apparatus for coating fusible interlinings, said apparatus comprising means for moving an electrically insulative fabric substrate to be coated through the apparatus, a drying oven for predrying the substrate, a metal drum over which the substrate moves, a bank of styli extending parallel to the axis of the drum said bank of styli comprising a plurality of parallel co-planar wires arranged in the manner of the teeth of a comb, the free ends of the styli being biased toward the peripheral surface of the drum such that the substrate can move between the free ends of the styli and the drum surface, means for applying a high voltage between the drum and the styli in order to set up a first electric field through which said substrate passes, said first electric field being operable to apply an electrostatic charge pattern to the predried substrate, a container for holding an adhesive material in particulate form, means for applying a second electric field between the adhesive material and the drum, the styli and the adhesive container being angularly spaced about the drum such that the fabric substrate moves first in contact with said styli and thence through the second electric field set up between the adhesive container and the drum, said second electric field being operable to attract the particulate adhesive material to the substrate by electrostatic attraction, which adhesive, by virtue of the charge pattern previously applied by the styli, arranges itself in the form of a discontinuous coating of adhesive material on the substrate, and means for heating the substrate and discontinuous coating to consolidate the adhesive on the surface of the substrate.

4,144,539
FEEDBACK CONTROL FOR LASER DISCHARGE SYSTEM

Neil R. Davie, Larimer County, and Joseph C. Lambiotte, Boulder County, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 643,893, Dec. 23, 1975, abandoned. This application May 13, 1977, Ser. No. 796,633
Int. Cl.[2] G01D *15/14*
U.S. Cl. 346—160 **16 Claims**



1. In an electrophotographic apparatus wherein the photoconductor is continuously discharged in an area bordering a latent image area, and is selectively discharged in the latent image area in accordance with the image content of the latent image, the improvement comprising:

radiant means to supply a beam of radiant power;

means for intercepting said beam and for generating a first order working beam;

means cooperating with said first order working beam and said photoconductor to cause said first order working beam to raster scan the photoconductor;

detector means associated with said first order working beam and operable to detect the power content of said working beam;

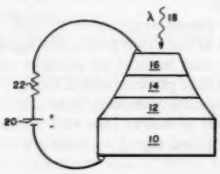
beam power control means controlled by said detector means and operable to maintain the power content of said beam adjusted to a reference level; and

synchronizing means controlled by the angular position of said photoconductor, and operable to enable adjustment of the beam's power content only when the beam is continuously discharging the photoconductor's border area.

4,144,540
TUNABLE INFRARED DETECTOR WITH NARROW BANDWIDTH

Nicholas Bottka, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 6, 1978, Ser. No. 875,254
Int. Cl.[2] H01L *27/14*
U.S. Cl. 357—30 **9 Claims**



1. A tunable energy detector comprising:

a P-type semi-conductor substrate;

a P-type buffer layer epitaxially grown on said substrate of semi-conductor material;

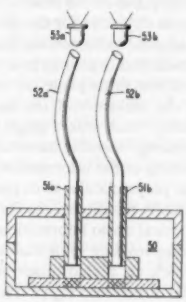
an active detector material layer epitaxially grown on said buffer layer which has a wavelength cutoff, λ_0, characteristic of said detector material; a top heavily N-doped layer of the same material composition as said detector material layer epitaxially grown on said detector material layer, where said top layer has a fundamental absorption edge λ_1 determined by the amount of doping which is a shorter wavelength than cut-off wavelength, λ_0, and is thicker than the penetration depth of wavelengths shorter than λ_1 and the diffusion length of the photo generated carriers near the surface of said top layer; and means for measuring current between said detector material layer and said top layer attached to said top layer and said substrate;

said p type buffer layer is of graded comporition for extending the lattice match between said substrate and said detector layer such that there is uniform potential change between said substrate and detector layers.

4,144,541
LIGHT-ACTIVATED SEMICONDUCTOR DEVICE PACKAGE UNIT

Donald L. Schaefer, Schenectady, and Victor A. K. Temple, Clifton Park, both of N.Y., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jan. 27, 1977, Ser. No. 763,171
Int. Cl.[2] H01L *27/14, 31/00, 23/02*
U.S. Cl. 357—30 **10 Claims**



1. An optoelectronic semiconductor unit comprising, in combination: a semiconductor device having a light-sensitive area; a guide tube having a pair of open ends; a locating fixture mounted on the device and extending outwardly therefrom, said locating fixture having a hole at its outer extremity in alignment with said area, one end of the tube being received in the hole and being in spaced relationship to said area, there being means for sealing the junction between the tube and the fixture; a light pipe removably insertable into the other end of said guide tube for conducting light energy onto said light-sensitive area; and a sealed package, said device and said locating fixture being wholly disposed in the package and said guide tube extending from the locating fixture and through and outwardly of the package, said package being operable for hermetically enclosing said semiconductor device and said one end of said guide tube.

4,144,542

AUDIO-VISUAL REPRODUCTION DEVICE

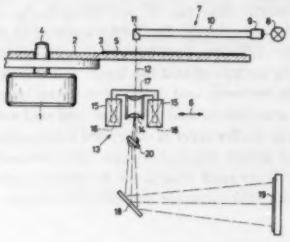
Heinz Preuss, Hannover, Fed. Rep. of Germany, assignor to BTS - Systemtwicklungs GmbH, Berlin, Fed. Rep. of Germany

Filed Nov. 21, 1977, Ser. No. 853,174

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1976, 2652936

Int. Cl.[2] H04N 5/84; G11B 7/24

U.S. Cl. 358—9 8 Claims



1. In an audio-visual reproduction device for transmitted light recordings of picture, audio, and control signals, which associated with each other directly in a certain order on a spiral are provided on a disc-shaped information vehicle adapted to be turned about the center point of the spiral at an even speed of performance, and adjacent to the information vehicle has an arrangement adapted to move in a direction radial to the spiral on lead screws in synchronism with the playback of the information vehicle, the arrangement comprising: on one side of said information vehicle an illuminating device and on the other side an optical sensing device for the picture, audio and control signals, means for converting signals originating from the information vehicle into electric pulses adapted to be processed by a TV receiver, and for compensating for displacements of the information vehicle in the direction perpendicular to its plane on the basis of optical signals in order to keep in focus an objective for the picture signals, said optical signals being adapted to be derived from a signal track of the information vehicle and to change in accordance with its displacement perpendicular to its plane, an objective for continuously projecting the picture and the audio and control signals of the information track onto a single line photo diode array, said objective being operable automatically to follow the vertical displacements of the information vehicle i.e. such displacements as occur perpendicular to its plane, said information track having mutually parallel tracks for black and white picture information, optical audio information, an optical strip-like signal track for compensating for horizontal displacements of the information vehicle i.e. such displacements which occur in its plane in the radial direction, a signal track for controlling the speed of rotation necessary for an even play back of the information track of the drive motor for the turntable holding the information vehicle, and a strip-like control track for compensating for vertical displacements of the information vehicle, said photo diode array being divided into diode groups which correspond to the projected images of these aforementioned tracks and are arranged to be independent of each other in order to prevent overlap of signals by the use of non-photo sensitive intermediate spaces, means for resetting the lateral drift of the light cone which is incident on the photo diode array and originates with the objective in accordance with the illumination of diodes intended for the compensation of the horizontal displacements of the information vehicle by virtue of the signal track associated with said diodes, and means for follow-up of said objective in accordance with the illumination of the diodes intended for the compensation of the vertical displacements of the information vehicle by means of the control tracks associated with said diodes.

4,144,543

PREDICTIVE CODEC CAPABLE OF SELECTING ONE OF AT LEAST THREE PREDICTION SIGNALS IN TWO STEPS

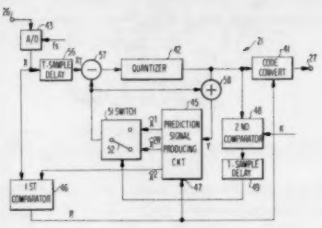
Toshio Koga, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1977, Ser. No. 861,340

Claims priority, application Japan, Dec. 16, 1976, 51/151526; May 12, 1977, 52/55069; Jun. 6, 1977, 52/67148; Jun. 6, 1977, 52/67149

Int. Cl.[2] H04N 7/12

U.S. Cl. 358—136 11 Claims



1. A system comprising a predictive encoder for producing an encoded signal representative of an autocorrelated signal supplied thereto and a predictive decoder responsive to said encoded signal for reproducing said autocorrelated signal, said autocorrelated signal taking those values at equally-spaced successive instants which are substantially correlated to the values said autocorrelated signal takes each of a plurality of predetermined durations after the respective instants, one of said predetermined durations being equal at least to the equal spacing between two adjacent ones of said instants, others of said predetermined durations being longer than said one predetermined duration, said encoded signal comprising a prediction error signal and a control signal interspersed in said prediction error signal, said prediction error signal having an amplitude variable from one of said instants to another thereof in compliance with said autocorrelated signal, said predictive encoder comprising:

encoder prediction means responsive to an encoder local signal supplied thereto at each of said instants for producing a group of at least three encoder prediction signals of predicted values predictive with approximation of actual values that said autocorrelated signal takes at least three of said predetermined durations after said each instant, respectively, said predicted values thereby corresponding to said actual values, respectively;

first encoded means responsive to said autocorrelated signal and a subgroup of said prediction signals for comparing said predicted values with the corresponding ones of said actual values to produce once in each block interval, equal to a predetermined number of said equal spacings, a selection signal indicative of the one of said subgroup of prediction signals providing the best approximation of said autocorrelation signal;

encoder selection means responsive to said selection signal for providing at output thereof at least two of said encoder prediction signals, at least one being determined by said selection signal;

second encoder means responsive to said autocorrelated signal and said at least two prediction signals for producing at each of said instants an encoder switching signal according to a first predetermined rule;

encoder switching means responsive to said switching signal for selecting one of said at least two prediction signals as an encoder switched signal according to a second predetermined rule;

means responsive to said autocorrelated signal and said encoder switched signal for producing said prediction error signal;

means responsive to said prediction error signal and said switched signal for producing said local signal; and

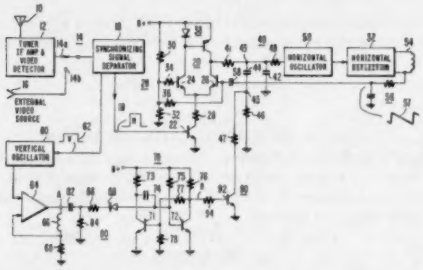
means for interspersing said selection signal in said prediction error signal as said control signal.

4,144,544

TELEVISION HORIZONTAL OSCILLATOR FREQUENCY CONTROL ARRANGEMENT FOR USE WITH TAPE RECORDER

Ronald E. Fernsler, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 19, 1977, Ser. No. 862,177
Int. Cl.[2] H04N 5/04
U.S. Cl. 358—158 **14 Claims**



1. A horizontal oscillator frequency control arrangement for synchronizing a horizontal oscillator with a source of synchronizing pulses which may have a change in phase occurring at the vertical deflection rate, comprising:

controllable horizontal rate oscillator means for producing horizontal rate oscillations the frequency and phase of which are controllable;

horizontal deflection means coupled to said horizontal rate oscillator means for promoting deflection current in synchronism with said oscillations;

phase detection means coupled to said horizontal deflection means and to the source of horizontal synchronizing pulses and responsive to said deflection current and to the horizontal synchronizing pulses for producing phase control signals representing the difference in frequency and phase therebetween;

controllable filter means coupled to said phase detector means and to said horizontal rate oscillator means for producing an averaged signal for controlling said oscillator, said filter means having a variable frequency-amplitude characteristic;

a source of synchronizing signals at said vertical deflection rate;

control means responsive to said source of vertical rate synchronizing signals and coupled to said controllable filter means for recurrently varying said characteristic at the vertical rate; and

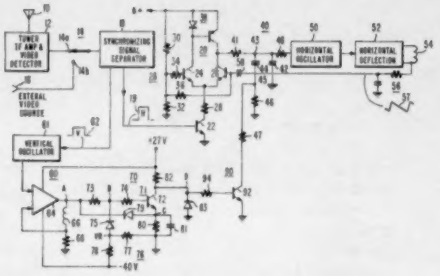
delay means coupled to said control means and to said source of vertical rate synchronizing signals for delaying operation of said control means for a predetermined interval after occurrence of said vertical synchronizing signal.

4,144,545

TELEVISION HORIZONTAL OSCILLATOR FREQUENCY CONTROL ARRANGEMENT FOR USE WITH A TAPE RECORDER

Ronald E. Fernsler, Indianapolis, and Michael L. Henley, Mooresville, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 19, 1977, Ser. No. 862,179
Int. Cl.[2] H04N 5/04
U.S. Cl. 358—158 **16 Claims**



1. A television horizontal oscillator synchronizing arrangement for synchronizing a horizontal oscillator with a source of signals including horizontal synchronizing signals which may have a step change in phase occurring at the vertical deflection rate, comprising:

controllable oscillator means for producing horizontal rate signals, the frequency and phase of which are controllable;

horizontal deflection means coupled to an output of said controllable oscillator means and responsive to said horizontal rate signals for promoting the flow of horizontal deflection current in a deflection winding;

phase detecting means including a first input coupled to said horizontal deflection means and a second input coupled to the source of horizontal synchronizing signals and responsive to said deflection current and the horizontal synchronizing signals for producing control signals representative of the phase difference therebetween;

filter means coupled to an output of said phase detecting means and to an input of said oscillator means for producing an averaged signal for controlling said oscillator, said filter means having a variable frequency-amplitude characteristic;

a source of synchronizing signals at said vertical deflection rate;

vertical deflection means coupled to said source of vertical rate synchronizing signals for producing a recurrent ramp signal in synchronism with said vertical rate synchronizing signal; and

threshold means coupled to said vertical deflection means and to said controllable filter means and responsive to a predetermined value of said recurrent ramp signal for varying said frequency-amplitude characteristic at a time delayed with respect to said vertical rate signals.

4,144,546

TELEVISION SIGNAL PROCESSING CIRCUIT FOR CORRECTING AMPLITUDE DISTORTIONS

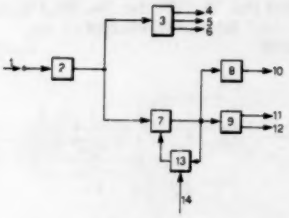
Roberto Dini, Turin, Italy, assignor to Indesit Industria Elettrodomestici, Rivalta (Turin), Italy

Filed May 10, 1977, Ser. No. 795,593
Claims priority, application Italy, May 21, 1976, 68242 A/76
Int. Cl.[2] H04N 5/04, 9/46
U.S. Cl. 358—174 **9 Claims**

1. A television signal processing circuit for correcting amplitude distortions in a received signal, without using means

sensitive to additional test signals purposely inserted into a transmitted television signal, comprising:

(a) a first means which analyze only the scanning synchronization signals of the said received signal for the purpose of detecting possible amplitude distortions present in the said



received signal, said first means generating a correction signal depending on the amplitude of the scanning synchronization signals measured from only the sync portion of black pedestal,

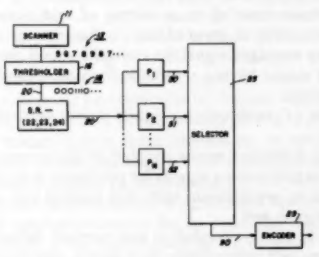
(b) second means which act on the said received signal to compensate for the effect of such amplitude distortions.

4,144,547

APPARATUS AND METHOD FOR ENCODING HALFTONE AND LINE COPY DATA

James C. Stoffel, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 4, 1977, Ser. No. 784,205
Int. Cl.[2] H04N *1/00*
U.S. Cl. 358—260 **17 Claims**



1. In a system for encoding pixel image data, the combination of:

a. multiple predictor means for predicting image values of said pixels, each of said predictor means generating an error signal representative of the accuracy of the predictions made, said prediction means including comparator means for comparing the predicted pixel image value with the established pixel image value to generate said error signal,

each of said prediction means having a predetermined prediction function, and

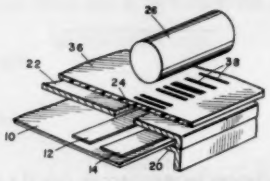
b. selector means for selecting from said multiple error signals the error signal of one of said prediction means having the least error for encoding.

4,144,548

VALIDATOR FOR MAGNETIC TICKETS

John B. Roes, San Diego, Calif., assignor to Cubic Western Data, San Diego, Calif.

Filed Feb. 10, 1978, Ser. No. 876,700
Int. Cl.[2] G11B *5/02*; G06K *19/06, 21/06*; G01D *15/06*
U.S. Cl. 360—59 **10 Claims**



1. A validator mechanism for magnetic tickets comprising in combination:

a housing,

a channel in said housing for receiving a ticket,

a source of instantaneous heat disposed adjacent said channel, said source of heat being sufficient to raise the temperature of a magnetic ticket in said channel to the Curie point, and

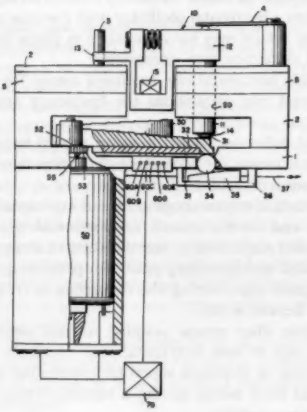
masking means for masking selected areas of a ticket in said channel from said heat source for defining a code on said ticket.

4,144,549

TRANSDUCER POSITIONING DEVICE

Donald L. Burdorf, Newport Beach; James Bjordahl, Arcadia; Roger S. Kincel, Whittier, and Harold E. Arns, Chino, all of Calif., assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 21, 1977, Ser. No. 853,397
Int. Cl.[2] G11B *21/08*
U.S. Cl. 360—78 **13 Claims**



1. In an apparatus for precisely positioning and adjusting a transducer head in vertical relationship to a series of parallel horizontal tracks on a recording medium, said apparatus having a vertically moveable bearing post which is secured at one end to the transducer head and is held at its other end in continuous contact with the upper surface of a cam having a plurality of horizontally planar steps formed thereon, said cam being rotatably driven by a motor, the improvement comprising:

a position signaling disk secured to said cam in a predeter-

mined relationship with respect to the stepping surfaces formed on the upper surface of said cam;

a means for supplying an electrical signal to said disk;

a plurality of signal detectors which determine whether an electrical signal is present at said disk for a given position of said cam;

a first signaling path formed on said disk for providing an electrical signal to said detectors when an error has occurred in the positioning of said cam by said cam motor in that said cam is positioned in a region outside of the allowable zone for the proper vertical positioning of the bearing post upon a desired cam stepping surface;

a second signaling path formed on said disk for providing an electrical signal to said detectors indicating the direction on which side of said allowable stepping zone which said error has occurred; and

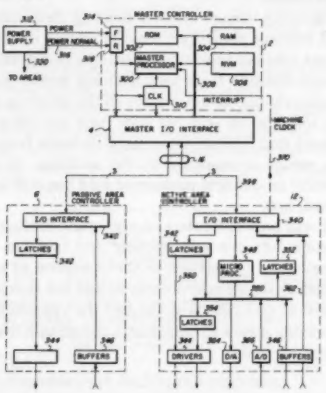
a logic circuit which controls the forward and backward drive of said cam motor in response to signals provided thereto by said detectors whereby any error occurring in the positioning of said bearing post upon a desired cam stepping surface will be corrected by said logic circuit driving said cam motor in the proper compensating direction until no error signal is produced.

4,144,550

REPRODUCTION MACHINE USING FIBER OPTICS COMMUNICATION SYSTEM

James M. Donohue, Rochester, N.Y.; Andrew T. Ling, Rancho Palos Verdes, Calif.; Richard M. Malinich, Penfield, N.Y., and Frank M. Nelson, Sherman Oaks, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 30, 1977, Ser. No. 829,014
Int. Cl.[2] G03G *15/00*; H04B *9/00*
U.S. Cl. 364—107 **5 Claims**



1. In an electrostatic type reproduction machine for producing copies of original documents having a plurality of copy processing elements and a plurality of control devices for operating said components to produce copies, said electrostatic machine comprising a substantial source of electrical noise and transients, the combination of:

a. a master controller having an arithmetic and logic control means for actuating said control devices in accordance with sensed copy processing parameters and a stored operational program to produce said copies, said control devices being remote from said master controller, and

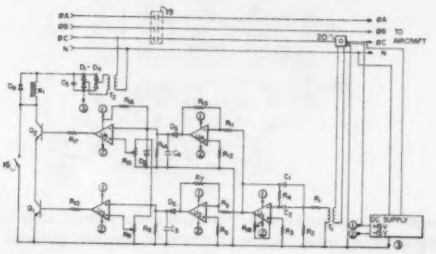
b. interface means remote from said master controller and connected in a communication path between said master controller and said controller devices for transmitting control signals therebetween, said interface means including a plurality of area controllers, at least one of said area controllers comprising a programmable controller, said controllers sensing operation of said copy processing elements and actuaing said control devices, and fiber optic link means transmitting said control signals between said master controller and said area controllers, said fiber optic link means isolating and protecting said master controller and said programmable area controller from said electrical noise and transients of said machine.

4,144,551

POWER INTERRUPTER DEVICE FOR AN ELECTRICAL DISTRIBUTION SYSTEM

David W. Smith, Alexandria, and John C. Logrando, Burke, both of Va., assignors to Value Engineering Company, Alexandria, Va.

Filed Jan. 13, 1977, Ser. No. 759,045
Int. Cl.[2] H02H *3/08*
U.S. Cl. 361—93 **7 Claims**



1. A power interrupter device for an electrical distribution system comprising a normally opened power contactor in a power line in the device and having a relay, start means connected to said power line and said relay for selectively energizing the coil of the relay to close the power contactor, means for sensing the current flow in the power line after the power contactor is closed to provide a signal proportional to the current flow through the device, means for generating a preset control signal, means for comparing the sense signal to said control signal, means bypassing said start means for maintaining said power contactor in the closed position when the sense signal is at a predetermined reference level with respect to said control signal, a first amplifier connected to said sensing means to amplify the sense signal and having an output, a second high current sense amplifier and a third low current sense amplifier both connected to the output of said first amplifier, a first high current sense comparator connected to said second amplifier and a second low current sense comparator connected to said third amplifier, said control signal generating means supplying a high reference voltage to said first comparator and supplying a low reference voltage to said second comparator, and means connected to the outputs of said first and second comparators for completing a conduction path to said power contactor when the high sense signal level is less than said high reference voltage and when the low sense signal level is greater than the lower reference voltage.

4,144,552

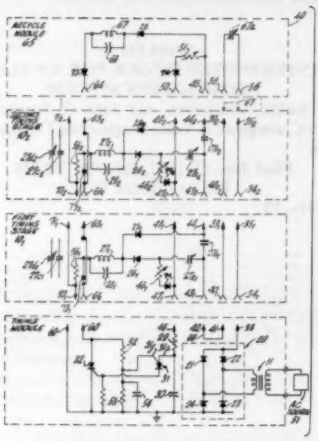
SEQUENTIAL TIMING CIRCUITRY

Dan Sibalis, 90 Gold St., New York, N.Y. 10038

Continuation-in-part of Ser. No. 789,576, Apr. 21, 1977, abandoned. This application Jun. 17, 1977, Ser. No. 807,536
Int. Cl.[2] H01H *47/14*
U.S. Cl. 361—166 **14 Claims**

1. In combination, a source of direct current energy; a relay including a relay actuating coil characterized by a minimum pull-in current required to energize said relay and a maximum holding current required to maintain an already activated relay in an energized state, normally closed relay contacts, relay latching means, said relay latching means, relay coil and normally closed contacts being serially connected and connected

to said direct current source, controlled switch means having a control port and a normally nonconductive conduction path connected in parallel with said relay latching means, and delay means connected to said control port of said controlled switch



means for energizing said controlled switch means after effecting a timing delay, wherein said relay further includes normally open contacts, and means including said normally open contacts selectively connecting said source of direct current energy with said relay coil.

4,144,553

APPARATUS FOR ELECTRODYNAMIC SPRAYING

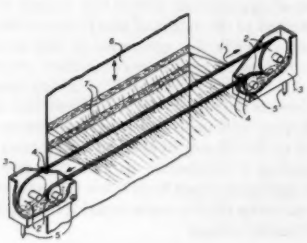
Klaus Schmidt, Hirschberg; Adolf Graber, and Hans U. Helbeck, both of Weinheim, Bergstr., all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed May 2, 1977, Ser. No. 792,620

Claims priority, application Fed. Rep. of Germany, May 8, 1976, 2620399

Int. Cl.[2] B05B 5/02

U.S. Cl. 361—227 **7 Claims**



1. An apparatus for use with a device for producing a suitable electric field to effect the electrodynamic spraying of solutions, dispersions or mixtures of solids, comprising at least one spray station for spraying into a given spray zone and including two spaced apart tanks for holding the medium to be sprayed and which are disposed on both sides of the spray zone, an endless band and pulleys disposed at each tank for circulating the band and constantly completely immersing a run thereof in each of the tanks, squeegees disposed at each tank to continuously remove the excess medium from the band before and after the spray zone to continuously define the amount of medium adhering to the band during the spraying and inlet and outlet connections in each tank to effect a desired level of the medium therein.

4,144,554

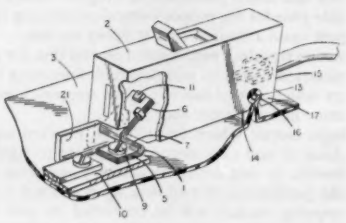
CIRCUIT BREAKER BOLT-ON FLEXIBLE CONNECTOR

Kenneth W. Erickson, Lincoln, Nebr., assignor to Square D Company, Park Ridge, Ill.

Continuation-in-part of Ser. No. 748,607, Dec. 8, 1976, abandoned. This application Oct. 17, 1977, Ser. No. 842,450

Int. Cl.[2] H02B 1/04

U.S. Cl. 361—355 **4 Claims**



1. A circuit breaker having a housing engaging a mounting rail spaced from a bus stab in a panelboard, the improvement comprising:

a flexible terminal connecting said breaker to said bus stab in said panelboard, said terminal having a flexible portion extending from said housing,

securing means on said terminal detachably securing said flexible portion to said bus stab in said panelboard at a first position spaced a first predetermined distance from said mounting rail in said panelboard with said portion thereafter folded between said housing and said bus stab in said panelboard,

rail receiving means on said housing detachably securing said housing pivotally to said mounting rail in said panelboard, said rail receiving means spaced a greater predetermined distance from said securing means than said first predetermined distance prior to the securing of said flexible terminal to said bus stab, said rail receiving means spaced said first predetermined distance from said securing means in response to the securing of said flexible portion at said first position to said bus stab in said panelboard, and

a fold wall on said housing engaging and folding said flexible portion between said housing and said bus stab in said panelboard in response to the operation of said securing means to secure said portion to said bus stab in said panelboard at said first position and the operation of said rail receiving means to detachably secure said housing to said mounting rail.

4,144,555

SINGLE MOUNT ELECTRICAL CONTROL DEVICE ASSEMBLY

James D. McGalliard, 11171 Fenwick Pl., Santa Ana, Calif. 92705

Filed Feb. 8, 1978, Ser. No. 876,080

Int. Cl.[2] H05K 7/20

U.S. Cl. 361—386 **9 Claims**

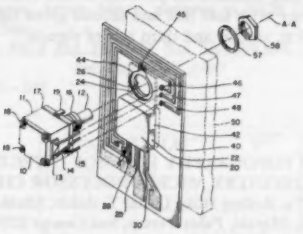
1. An electrical control device assembly mountable against an instrument panel comprising:

a circuit board;

a variable resistor mounted to said circuit board;

an integrated circuit module mounted to said circuit board so as to be disposed within the same plane as said circuit board;

heat sink means connected to said integrated circuit module and extending adjacent one side of said circuit board; and



mounting means fastening together said circuit board, variable resistor, and integrated circuit module, and urging said heat sink means directly against an instrument panel.

4,144,556

OMNI-DIRECTIONAL PHOTOGRAPHIC ILLUMINATION APPARATUS

George S. Bond, c/o The George S. Bond Company, 6349 N. Guilford Ave., Indianapolis, Ind. 46220

Filed Jan. 23, 1978, Ser. No. 871,347
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—16 **12 Claims**

1. Apparatus for producing substantially omni-directional lighting of an object to be photographed, comprising

a shell of generally spheroidal shape having an access opening therein through which a camera may view an object within the shell,

means to support an object within the shell in position to receive light from substantially all directions from the inner surface of the shell so as to be illuminated by such light from substantially all directions,

said inner surface having light diffusing reflectance characteristics over substantially its entire area,

said shell being constructed and arranged to permit said surface to be illuminated over a substantial area so as to cause light to be diffusely reflected therefrom to other parts of the surface and from such surface onto an object supported by said support means.

4,144,557

EL FLASHLIGHT

Charles Kerr, III, and Daniel V. Krause, both of East Aurora, N.Y., assignors to Astronics Corporation, East Aurora, N.Y.

Filed Sep. 19, 1977, Ser. No. 834,393
Int. Cl.[2] F21V *9/16*
U.S. Cl. 362—84 **11 Claims**

1. An electroluminescent flashlight, comprising

a flashlight housing having thereon a manually-operable ON-OFF switch, and containing one or more flashlight batteries,

a plane, flat, EL lamp comprising a layer of electroluminescent disposed between two electrodes, one of which is capable of transmitting light,

means releasably mouting said lamp transversely across an opening in one end of said housing so said one electrode faces exteriorly of said housing,

a control circuit removably mounted in said housing between said batteries and said lamp and operative, when said switch is in its ON position; to convert DC input from said batteries to AC output signals, and

means for releasably connecting the output of said circuit to said electrodes to apply said AC signals thereacross, and thereby to cause said electroluminescent layer to produce a glowing light viewable from the exterior of said housing through said one electrode,

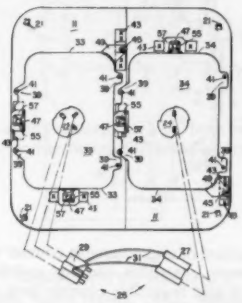
said connecting means comprising two sets of spaced contacts releasably engageable with each other adjacent the center and the peripheral edge, respectively, of said lamp.

4,144,558

COMBINED TRIM RING AND SUPPORT FOR HEADLIGHTS

James E. Ferrell, 1005 Parkside, Lot 29, Peoria, Ill. 61614

Filed Jun. 22, 1977, Ser. No. 809,064
Int. Cl.[2] F21M *3/14*
U.S. Cl. 362—255 **4 Claims**



1. A combined support plate and trim ring for mounting at least one headlight unit in an aperture in the body shell of a vehicle, comprising: a plate having at least one open area of headlight-face-area size, an open-faced metallic shell for protectively covering the rear surface of a standardized parabolic-reflector-type sealed-beam headlight lamp, said metallic shell having a rearwardly flanged central opening of a size and shape to protectively surround the rearwardly projecting terminals of said lamp when installed in said shell, a flanged lamp-retainer ring adapted to embrace the margin of the face of said lamp, peripherally spaced interconnecting means for pulling said ring and said shell together to clamp said lamp firmly in said shell to form therewith a headlight unit, means for fastening said headlight unit to said plate in said open area, said plate being of a size to overlap the face margins of said body-shell aperture, and quickly attachable and detachable means for interconnecting the overlapping portions of said body shell and said plate.

4,144,559

POWER CONVERTER CONTROL SYSTEM

Yoshio Okumura, Katsuta; Kyozo Tachibana, Naka; Hiroshi Sato, Katsuta, and Genichi Matsumoto, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 31, 1977, Ser. No. 829,476
Claims priority, application Japan, Sep. 6, 1976, 51/105794
Int. Cl.[2] H02M *7/155*
U.S. Cl. 363—88 **5 Claims**

1. A control system for use with a power converter including a cascade connection of at least one continuously controlled converter unit whose phase lag in conduction is controlled to continuously change between a maximum phase lag and a minimum phase lag and a plurality of on-off controlled converter units which are subjected to on-off control of conduction, said control system comprising:

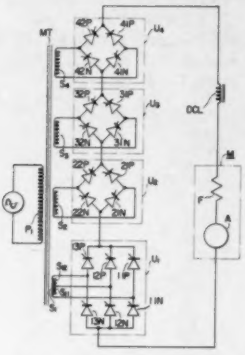
a master controller for producing an output variable depending on and indicative of a number of the convert units to be operated,

a reversible counter which changes the content of count when said minimum or maximum phase lag is reached by said continuously controlled rectifier unit, said content being represented by a plurality of binary bits.

a unit change control circuit for applying one of said binary bits of said reversible counter as an operation signal to said

continuously controlled converter unit and the remaining bits of said reversible counter as respective operation signals to said on-off controlled converter units, and

a comparing and identifying circuit means for comparing the content of count of said reversible counter with the output of said master controller and for enabling a counting operation of said reversible counter until the count content of said reversible counter coincides with the output of said master controller.



4,144,560

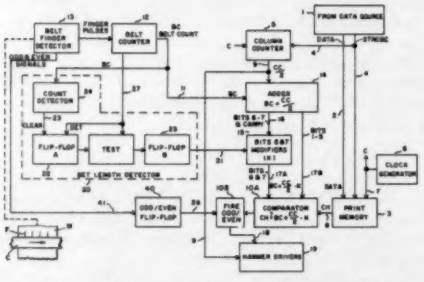
ADAPTIVE CONTROL FOR SIGNAL PROCESSING

Samuel C. Harris, Jr., and Terry L. Hewitt, both of Waynesboro, Va., assignors to General Electric Company, Waynesboro, Va.

Division of Ser. No. 534,600, Dec. 20, 1974, Pat. No. 4,009,654. This application Nov. 24, 1976, Ser. No. 744,815

Int. Cl.[2] B41J *5/30*

U.S. Cl. 364—113 **4 Claims**



1. In combination, a source of a plurality of information signals, each of said information signals comprising a coded pulse group each of which comprises a given number of information bits, said coded pulse groups representing the values of respective functions varying with time, means for algebraically combining first and second ones of said information signals to obtain combined signals comprising coded pulse groups, means for processing selected bit portions of said combined signals to obtain a first set of signals if the value of such combined signals is less than a first predetermined limit and to obtin a second set of signals if the value of such combined signals is greater than or equal to said first predetermined limit but less than a second predetermined limit and to obtain a third set of signals if the value of such combined signals is greater than or equal to said second predetermined limit, said means for processing comprising means for analyzing one of said signals that was combined to determine if its value is greater than a first predetermined limit to obtain a first given signal and to determine if its value is less than said last named first predetermined limit to obtain a second given signal, means for modifying said selected bit portions in a first manner to obtain first modified selected bit portions of said combined signals, and means for further modifying said modified bit portions of said combined signals in accordance with said first and second given signals to provide said first, second and third sets of signals.

4,144,561

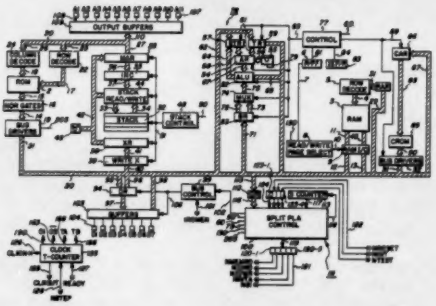
CHIP TOPOGRAPHY FOR MOS INTEGRATED CIRCUITRY MICROPROCESSOR CHIP

George K. Tu, Rolling Hills; Lamar T. Baker, Manhattan Beach; Robert E. Markle, Palos Verdes, and George E. Mager, Manhattan Beach, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 8, 1977, Ser. No. 813,902

Int. Cl.[2] G06F *1/00, 9/00*

U.S. Cl. 364—200 **9 Claims**



1. An integrated circuit microprocessor chip that is circumscribed in a clockwise sequence by first, second, third and fourth edges thereby defining a surface therefore, said chip comprising:

(a) an internal data bus;

(b) an internal address bus;

(c) I/O means located relatively along said first edge and coupled to said data bus for entering data into and for receiving data from said microprocessor;

(d) output means located relatively along said third edge and coupled to said address bus for receiving address data from said microprocessor;

(e) program storage means located relatively closer to said third and fourth edges than said first and second edges and including a ROM, containing instruction words coupled to said data bus and said address bus, for defining the operation of said microprocessor;

(f) ALU means located relatively closer to said first and fourth edges than said second and third edges and coupled to said data bus for performing arithmetic and logic operations on data;

(g) data storage means located relatively adjacent to said ALU means relatively closer to said first and fourth edges than said second and third edges and including a RAM coupled to said data bus for storing data;

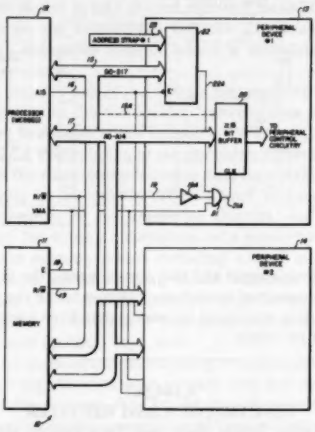
(h) mask means located relatively adjacent to said ALU means in the approximate center of said surface and coupled to said data bus for decoding a condition field of an instruction word from said program storage means; and

(i) control means located relatively closer to said first and second edges than said third and fourth edges and coupled to said data bus, said control means receiving said instruction words from said program storage means for generating commands which define the operation of said microprocessor in response to said instruction words.

4,144,562
SYSTEM AND METHOD FOR INCREASING MICROPROCESSOR OUTPUT DATA RATE

Paul J. Cooper, Acton, Mass., assignor to NCR Corporation, Dayton, Ohio

Filed Jun. 23, 1977, Ser. No. 809,496
Int. Cl.[2] G06F *3/00*
U.S. Cl. 364—200 10 Claims



6. A method of operating a data processing system, of the type having a larger number of address lines than data lines, so as to enable the transfer of a magnitude of data greater than that transferable on the data lines, comprising the steps of:

(a) temporarily storing a peripheral address code in a processor;

(b) temporarily storing a data word in said processor, said data word having a larger number of bits than said peripheral address code;

(c) transferring said data word to a peripheral device via an address bus during a machine cycle;

(d) transferring said peripheral address code to said peripheral device via a data bus during said machine cycle;

(e) enabling loading of said data word into a buffer of said peripheral device in response to recognition of said peripheral address code by a code recognition circuit of said peripheral device.

4,144,563
MICROPROCESSOR SYSTEM

Dale A. Heuer; Phillip C. Schloss, and Larry L. Schroeder, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 682,803, May 3, 1976. This application Nov. 21, 1977, Ser. No. 853,784
Int. Cl.[2] G06F *1/00*
U.S. Cl. 364—200 10 Claims

1. In a data processing system arithmetic and logic circuitry comprising

an arithmetic and logic unit (ALU) having first and second input registers;

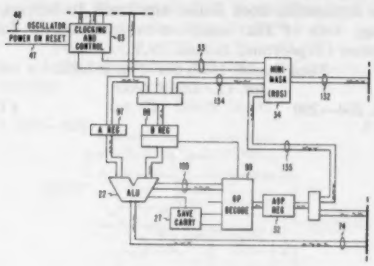
said ALU having a series of bit positions equal in number to the width of the data path,

each said bit position including an adder circuit,

each said adder circuit including a series of gating means operable to selectively enable portions of said adder circuit; and

operation decode means having a series of output gate lines each interconnected with a corresponding gating means at each of said adder bit positions,

said operation decode means being operable to generate a plurality of signal combinations on said output gate lines

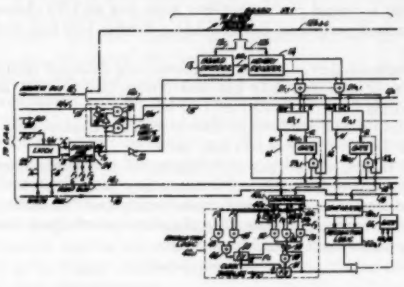


enabling varying adder circuit portions to effect the performance of other functions by said adder circuits.

4,144,564
ASSOCIATIVE MEMORY

Sydney M. Lamb, North Haven, Conn., assignor to Semionics Associates, Berkeley, Calif.

Filed Apr. 19, 1977, Ser. No. 788,797
Int. Cl.[2] G06F *7/34*
U.S. Cl. 364—200 13 Claims

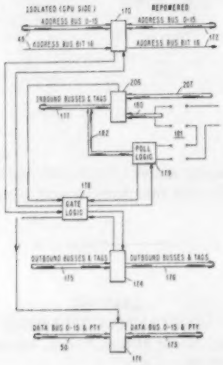


1. In combination in an associative memory, a plurality of random access memory modules each including plural information storage addresses, plural comparator means, means connecting each of said comparator means to a different one of said random access memory modules for receiving information read out therefrom, data bus means connected to each of said memory modules and each of said comparator means for supplying information to and receiving information from said random access memory modules during memory write and read operations, respectively and supplying match information to said plural comparator means during associative memory operation, memory accessing means including common address bus means connected to said memory modules, each of said comparator means including means for comparing the information supplied thereto by said associated memory module with information present on said data bus means and for developing an output signal representing the results of said comparison, and means for storing said output result signals of said comparator means, wherein each of said random access memory modules comprises read and write control port means, read-write control means connected to said read-write control port means of said random access memory modules, and means for selectively inverting a write command supplied by said read-write control means to thereby impress a read command at said read-write control port means of said memory modules.

4,144,565
INPUT/OUTPUT INTERFACE CONNECTOR CIRCUIT FOR REPOWERING AND ISOLATION

Max A. Bouknecht, Boca Raton, and Louis P. Vergari, Palm Springs, both of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 6, 1977, Ser. No. 757,403
Int. Cl.[2] G06F *3/00*
U.S. Cl. 364—200 **4 Claims**



1. A data processing system input/output (I/O) interface connector circuit for controlling the interconnection of data, address, and control signal lines between a first I/O bus associated with a central processing unit including an I/O channel and attached peripheral devices, and a further I/O bus, comprising:

bidirectional driver means interconnecting data and address lines of the first I/O bus and corresponding data and address lines of the further I/O bus;

unidirectional driver means interconnecting control lines of the first and further I/O bus; and

logic means, connected and responsive to predetermined signals being transferred between any peripheral device and the I/O channel, and connected to said bidirectional driver means, for controlling the direction of signal transfer on the data and address lines.

4,144,566
PARALLEL-TYPE PROCESSOR WITH A STACK OF AUXILIARY FAST MEMORIES

Claude Timsit, Grigny, France, assignor to Thomson-CSF, Paris, France

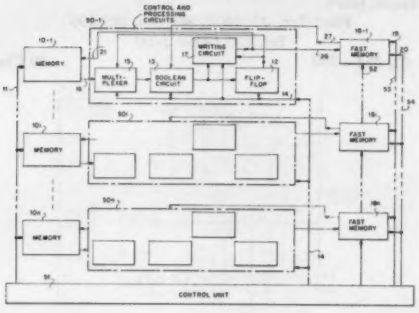
Filed Aug. 11, 1977, Ser. No. 823,854
Claims priority, application France, Aug. 11, 1976, 76 24555
Int. Cl.[2] G06F *7/38, 13/00, 15/16*; G11C *9/06*
U.S. Cl. 364—200 **9 Claims**

1. A parallel-type processor comprising a plurality of elementary processors connected in parallel to an address bus and to a control bus, each of said elementary processors comprising:

a memory unit having an input and an output;

a fast memory unit having an input and an output, said fast memory unit having a lower access time than said memory unit; and

control and calculation means, comprising a single storage flip-flop, said control and calculation means being connected to the input andd output of said memory unit and to the input and output of said fast memory unit, for performing calculations on two bits extracted from the group of units formed by said memory unit, said fast memory and said storage flip-flop, the result of said calculations being written in one of the units of said group, the fast memory units of all of said elementary processors being connected together to form a stack for simultaneously translating any data from any word to the adjacent word, said stack having an input and an output and defining rows and columns of data, said parallel type processor further comprising a multiplexer having one set of outputs connected

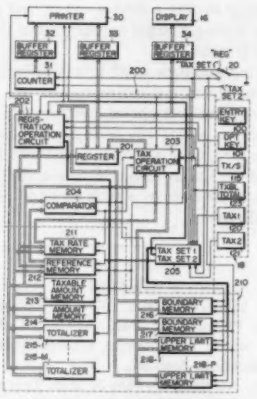


to said stack input and two sets of inputs, the first of them being connected to said stack output while the second set of inputs is connected to receive data from a souce extenal to said processor.

4,144,567
ELECTRONIC CASH REGISTER

Yuji Tadakuma; Syunji Saito, and Toru Eguchi, all of Ohito, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed May 26, 1977, Ser. No. 800,943
Claims priority, application Japan, May 26, 1976, 51-60786; Jun. 17, 1976, 51-71423
Int. Cl.[2] G06F *7/48, 15/20*
U.S. Cl. 364—405 **6 Claims**



1. An electronic cash register comprising:

a keyboard having a plurality of entry keys and a plurality of transaction keys;

first and second memory means;

a printer;

switching means capable of taking first and second positions; and

data-processing means coupled to said switching means and being set at a tax set mode when said switching means takes said first position, to store in said first memory means information on the relationship between a taxable amount and a tax assessable thereon each time the entry key section and transaction key section are operated, and to issue a print instruction to said printer in response to the operation of a specified transaction key to cause said printer to

print out information on the relationship between the taxable amount and tax assessable thereon, and said data processing means being set at a registration mode when said switching means takes said second position and being responsive to key depression to store in said second memory means information on a sales amount and a taxable amount, and, responsive to operation of a prescribed transaction key, to calculate a tax assessable on the taxable amount stored in said second memory means from information on the relationship between the taxable amount and tax assessable thereon which is stored in said first memory means;

said first memory means including a first memory for storing information on the relationship between data of a taxable amount belonging to an unequally differentiated section and data corresponding to tax assessable thereon, information on the relationship between data on a taxable amount belonging to an equally differentiated section and data corresponding to tax assessable thereon, and a second memory for storing information on a prescribed tax rate;

said second memory means including a third memory into which said data-processing means transfers data corresponding to a referential taxable amount in response to the operation of at least one of said entry keys and a specified one of said function keys; and

said data-processing means including a comparator for comparing a registered taxable amount data and said referential taxable amount data stored in said second memory means, and coupled to energize said second memory when said registered taxable amount is larger than said referential taxable amount data, and to energize said first memory when said taxable amount data is not larger than said referential taxable amount data.

4,144,568

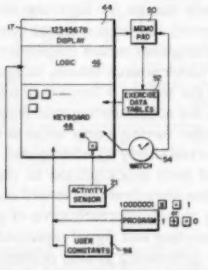
EXERCISE RECORDER

Alexander J. Hiller, 13045 Tompkins La., Bowie, Md. 20715, and Frank M. Hardy, 15714 Dorset Rd., Laurel, Md. 20810

Filed Sep. 17, 1976, Ser. No. 724,263

Int. Cl.[2] G01L *5/02*; H01H *1/00*

U.S. Cl. 364—410 **14 Claims**



1. The portable exercise measuring device, comprising, in combination, a mechanical sensor-transducer, having outputs representative of muscular movements of an exercising body, said transducer comprising a movable inertial mass; a computer for converting said output to signals representative of the number of Calories expended by said exercising body, said computer including means for accumulating the total number of said signals and displaying said total; and timing means connected to said computer for modifying the sum of said accumulation dependent upon the type, vigor or period of the exercise.

4,144,569

METHOD AND ARRANGEMENT FOR COMPENSATING MOTION ARTIFACTS IN COMPUTED TOMOGRAPHY

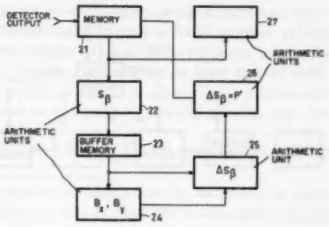
Wolfgang Wagner, Norderstedt, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 5, 1977, Ser. No. 839,620

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1976, 2645416

Int. Cl.[2] G01N *23/00*

U.S. Cl. 364—414 **3 Claims**



1. A computed tomography device for determining the spatial distribution of the absorption of radiation in a planar slice of a body from a plurality of measuring sets, each of which represent a series of measuring values which correspond to an integral of the absorption of the body along one of a multiplicity of at least substantially parallel measuring beams, in which the various measuring sets are derived from measuring values obtained with the aid of measuring beams which are differently oriented relative to each other within the planar slice and the spatial distribution of the absorption is derived from the sets of measuring values by superposition, of the type comprising a radiator for generating a beam of a body penetrating radiation and one or a plurality of detectors for measuring the radiation passing through the planar slice of the body, the measurements being performed with radiation passing at different orientations through the planar slice of the body, the direction of the radiation being in the plane of said slice; a memory of storing the series of measuring values; and a first arithmetic unit for determining the spatial absorption distribution in the planar slice by superposition; and further comprising, as an improvement:

second arithmetic unit means connected to the memory, which functions to calculate the coordinates of a weighted-mean point (S,β) for each series of measuring values $(Q(p,\beta))$ measured with at least substantially the same orientation in accordance with the relationship

$$S\beta = \frac{\sum_p p \cdot Q(p,\beta)}{\sum_p Q(p,\beta)};$$

a weighted-mean memory for storing the weighted-mean points;

third arithmetic unit means which function to calculate the value of the perpendicular weighted-mean distance $(D(G\beta,B))$ from the line through the weighted-mean point to the coordinates (B_x, B_y) of a fixed point (B), for each weighted-mean point, using in accordance with the relationship

$$\Delta S\beta = S\beta + B_x \sin\beta - B_y \cos\beta; \text{ and}$$

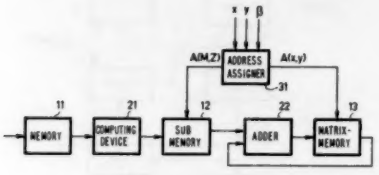
a distance memory for storing the weighted-mean distances;

the first arithmetic unit being connected to determine the distribution of absorption in the planar slice using the measuring values of measuring series shifted by the associated weighted-mean distance.

4,144,570
METHOD OF AND DEVICE FOR MEASURING THE DISTRIBUTION OF A RADIATION IN A PLANE OF A BODY

Wolfgang Wagner, Norderstedt, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 13, 1976, Ser. No. 749,744
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1975, 2556012
Int. Cl.[2] G01N *23/06*; G06F *15/42*
U.S. Cl. 364—414 **11 Claims**



7. A device for measuring the distribution of the absorption or of the emission of radiation in a plane of a body which is divided into picture elements, in which in a large number of measuring series the absorption and the emission, respectively, of the body are measured in a large number of directions in the plane, each measuring series providing a number of measured values of the absorption or of the emission along stripes extending at least approximately parallel with respect to each other, the width of each stripe corresponding approximately to the dimensions of a picture element, and in which intermediate values are formed from the measured values of a measuring series, which intermediate values are each assigned to one of said picture elements and are added to the intermediate values previously assigned to said picture element, including the improvement wherein, a number of subvalues are formed by interpolation of the measured values, which subvalues represent the absorption along substripes whose center lines are equally spaced, after which an intermediate value is assigned to each picture element which is equal to the subvalue which represents the absorption in a substripe whose center line is closest to the center of the picture element comprising:

a computing device connected for computing subvalues from the measured values by interpolation;

a submemory connected for storing the subvalues;

a matrix memory having a memory site for at least each picture element connected for storing the absorption values assigned to the various picture elements; and

an assigning device which assigns to each picture element in the matrix memory an intermediate value which is equal to a subvalue stored in the submemory.

4,144,571
VEHICLE GUIDANCE SYSTEM

William F. Webber, Dallas, Tex., assignor to E-Systems, Inc., Dallas, Tex.

Filed Mar. 15, 1977, Ser. No. 777,776
Int. Cl.[2] G01C *21/12*
U.S. Cl. 364—450 **13 Claims**

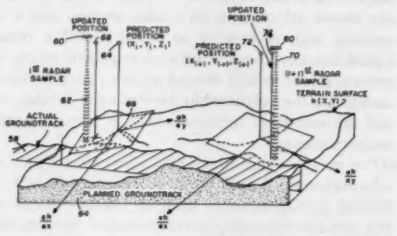
1. A vehicle navigation system, comprising:

terrain sampling means for determining at spaced time intervals the elevation of terrain beneath the vehicle and generating point by point data samples of terrain elevation,

a dead reckoning guidance system for providing vehicle position and velocity signals,

data storage means containing prerecorded point by point terrain data,

a computational processor responsive to the point by point samples of terrain elevation, vehicle position and velocity signals, and prerecorded point by point terrain data to generate a current predictive position signal and combine the current predictive position signal with a previously generated and stored updated position signal into a new updated position signal for providing discrete signal samples of vehicle velocity correction and vehicle position correction, and

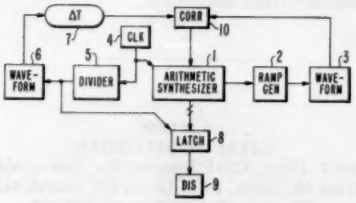


a navigation controller responsive to the signal samples from said computational processor to generate vehicle navigation signals.

4,144,572
ACCURATE PHASE-MEASURING SYSTEM USING ARITHMETIC SYNTHESIS

Eugene R. Starner, Bethlehem, Pa., and Edward J. Nossen, Cherry Hill, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 15, 1977, Ser. No. 824,964
Int. Cl.[2] G01R *25/00*; G06J *1/00*; H03B *3/04*
U.S. Cl. 364—487 **7 Claims**



6. In a circuit for controlling the phase of a signal including means for generating said signal in response to a control signal and clock source means for deriving clock signals having a given clock period, the improvement comprising;

arithmetic synthesizer means responsive to said clock signals from said clock source means, including frequency register means for storing a frequency number and accumulator means for accumulating said frequency number into a phase number having a new value at the end of each clock period derived solely by adding said frequency number at the end of each clock period to the value of the phase number then already stored in said accumulator means, for producing signals representative of phase; and

means for coupling said signal representative of phase to said means for generating as said control signal.

4,144,573
METERING SYSTEM

Gerald C. Trussell, Park Ridge; James R. Caruth, Chicago; Phillip Jalowiec, Chicago, and Michael J. Pociask, Chicago, all of Ill., assignors to Sun Electric Corporation, Crystal Lake, Ill.

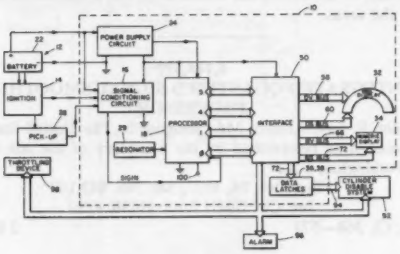
Filed Oct. 27, 1976, Ser. No. 736,082
Int. Cl.[2] G06F *3/05*; G01M *15/00*
U.S. Cl. 364—506 **29 Claims**

1. A metering system comprising in combination:

signal conditioning means for receiving a state-indicating

signal and producing a digital input signal in response thereto;

processor means for processing said digital input signal, said processor means having at least a first and second output port, said processor means providing a first output signal at said first output port and a second output signal at said second output port, said first output signal and said second output signal having a predetermined relationship to said state-indicating signal; and



output means for displaying said first output signal and said second output signal, said output means including a group of output displays having a series of output components;

said first output signal successively enabling said output displays for a first predetermined time and disabling said output displays for a second predetermined time therebetween, said second output signal enabling a predetermined number of said output components within each of said output displays, said processor means refreshing said second output signal during said second predetermined time.

4,144,574

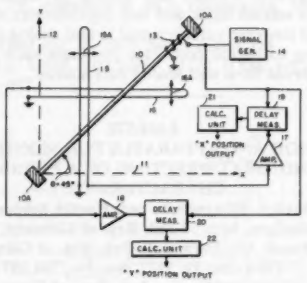
MULTI-AXIS POSITION DETERMINING SYSTEM

Jacques R. Chamuel, Allston, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Oct. 14, 1977, Ser. No. 842,053

Int. Cl.[2] G01S *3/80, 5/18*

U.S. Cl. 364—561 **19 Claims**



1. A position determining device comprising

delay means mounted at a selected angle greater than 0° with reference to at least one selected direction along which said position is to be determined;

first transducer means fixedly coupled to said delay means;

second transducer means coupled to said delay means and relatively movable with respect to said delay means so as to maintain substantially the same coupling with said delay means throughout its movement;

means for activating one of said first and second transducer means to generate a signal which travels along said delay means, the other of said first and second transducer means detecting said travelling signal as it travels past said other transducer means;

means for determining the delay of said signal as it travels from the activated transducer means to the detecting transducer means whereby the position of said detecting transducer means relative to said activated transducer means along said delay means is determined; and

means responsive to said delay determination for calculating the position of said detecting transducer means relative to said activated transducer means along said at least one selected direction.

8. A device for determining at least one angular position comprising

at least three movable elements, each angularly movable with respect to each other about a different axis, each of said different axes having a fixed angular relation to at least two others of said different axes, a circular delay element fixedly mounted on at least one of said at least three movable elements at a position in a plane which is at a selected angle with reference to the axis associated therewith;

driver transducer means fixedly coupled to said delay element;

receiver transducer means fixedly mounted on said at least two others of said at least three movable elements adjacent said at least one movable element, each of said receiver transducer means being coupled to said delay element and being relatively movable with respect thereto so as to maintain substantially the same coupling with said delay element throughout its movement;

means for activating said driver transducer means to generate a signal which travels along said delay element, said receiver transducer means detecting said travelling signal as it travels past each of said receiver transducer means;

means for determining the delay of said signal as it travels from said driver transducer means to each of said detecting receiver transducer means whereby the position of said detecting receiver transducer means relative to said driver transducer means along said delay element is determined; and

means responsive to said delay determinations for calculating the angular position of said at least two others of said at least three movable elements with respect to said at least one movable element.

4,144,575

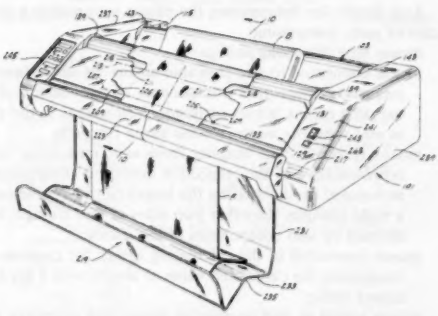
APPARATUS FOR DISPENSING FABRIC FROM A BOLT

Gail B. Schwarz, Belleville, Ill., assignor to The Measuregraph Company, St. Louis, Mo.

Division of Ser. No. 560,358, Mar. 20, 1975, Pat. No. 4,004,748, and a continuation-in-part of Ser. No. 477,166, Jun. 6, 1974, abandoned. This application Nov. 8, 1976, Ser. No. 739,971

Int. Cl.[2] G06F *15/20;* B26D *5/40*

U.S. Cl. 364—562 **8 Claims**



1. Apparatus for dispensing fabric from a bolt comprising an endless belt conveyor, means guiding the conveyor for travel in an endless path including an upwardly opening loop in

which a bolt may be cradled with the bolt extending transversely of the conveyor, means for driving the conveyor to rotate a bolt cradled in the loop to unwind fabric from the bolt, said guiding means including a first and a second guide for establishing said loop, the conveyor travelling over the first guide, thence downwardly, upwardly and over the second guide, said apparatus having means mounting said guides for relative movement toward and away from one another as the bolt rotates, said guides being relatively movable away from one another as the bolt rotates to a horizontal position and toward one another as the bolt rotates away from horizontal position, means for measuring the travel of the endless belt conveyor as a measure of the length of fabric unwound from the bolt, means for starting the endless belt conveyor, means for starting operation of the measuring means in response to arrival of the leading edge of the fabric at a reference position, means controlled by the measuring means for stopping the endless belt conveyor upon unwinding of a predetermined length of fabric from the bolt, the means for stopping the endless belt conveyor including means for presetting the length of fabric to be dispensed, means for setting the price per unit length of the fabric to be dispensed, and means controlled by said price setting means and said measuring means for calculating and indicating the price of the length of fabric dispensed.

4,144,576
DEVICES FOR MEASURING PLANAR AREA WITHIN A CLOSED CURVED PATH

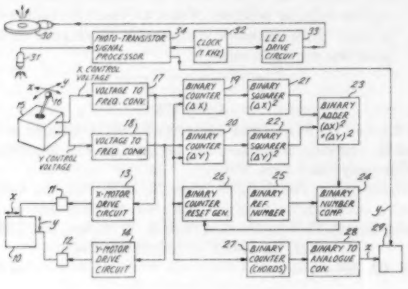
David E. Mutton, Bromley, and Edward G. C. A. Boyd, Purley, both of England, assignors to National Research Development Corporation, London, England

Filed Dec. 29, 1976, Ser. No. 755,569

Claims priority, application United Kingdom, Jan. 7, 1976, 00513/76

Int. Cl.[2] G06F *15/20*

U.S. Cl. 364—564 **2 Claims**



1. A device for determining the planar area within a closed curved path, comprising:

means movable along said path;

means connected to said movable means for simultaneously measuring respective components of movement of the movable means in two orthogonal directions in the plane as said movable means travels along the path;

means responsive to outputs from said measuring means representative of the respective measured components of movement for calculating the length of the hypotenuse of a right triangle, the other two sides of said triangle being defined by said components of movement;

means connected to the calculating means for continuously comparing the calculated value of length with a predetermined value;

means joined to said comparing means and operative upon occurrence of equality of the compared values for indicating that the movable means has traveled a distance defined by a unit hypotenuse;

means for locating, with respect to the two orthogonal directions, each of said unit hypotenuses traveled by the movable means;

means for determining each of the areas bounded by a unit hypotenuse, one orthogonal direction and perpendiculars to that direction from the ends of the hypotenuse, each area having associated with it an arithmetical sign related to the general direction of movement of the movable means along said one orthogonal direction during production of that hypotenuse; and

means to determine the modulus of the arithmetical sum of the areas.

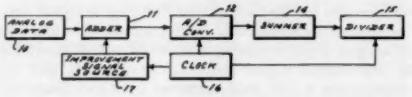
4,144,577
INTEGRATED QUANTIZED SIGNAL SMOOTHING PROCESSOR

Gordon S. Ley, Arnold, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 14, 1977, Ser. No. 842,140

Int. Cl.[2] G06F *7/38*; H03K *4/02*

U.S. Cl. 364—571 **2 Claims**



1. An integrated quantized signal smoothing processor being comprised of an analog data source providing analog signals, an adder having first and second inputs and a single output, said first input receiving analog signals from said analog data source, an analog to digital converter having first and second inputs and a single output, said first input of said analog to digital converter receiving the output from said adder, a summer receiving the output from said analog to digital converter for summing a number n of successive samples, a divider receiving the output from said summer for division by the number n, an improvement signal source providing a predetermined staircase voltage signal to said second input of said adder said staircase voltage signal having n steps, and a clock controlling said divider, said analog to digital converter through its second input, and said improvement signal source to add said staircase voltage signal to said analog signals when said analog to digital converter processes each said analog signal received from said analog data source.

4,144,578
METHOD AND APPARATUS FOR MONITORING AND/OR CORRECTING OF A PHYSICAL CHARACTERISTIC

Martin Mueller, Bickenbach, and Harald Schoenfeld, Darmstadt-Arheilgen, both of Fed. Rep. of Germany, assignors to Carl Schenck AG, Darmstadt, Fed. Rep. of Germany

Filed Jan. 31, 1977, Ser. No. 764,087

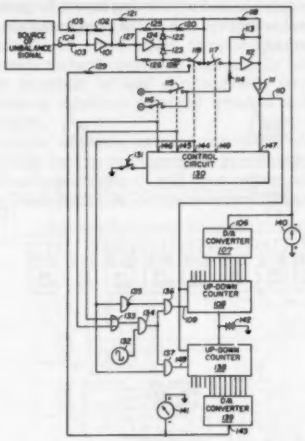
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1976, 2605485

Int. Cl.[2] G06F *15/36*; G06G *7/18*

U.S. Cl. 364—575 **16 Claims**

1. A control signal modifying system comprising a source of input signals corresponding to sequentially occurring measurements, first and second storage means, comparing means operatively connected to said input signal source and to said first storage means for continuously comparing said input signals with signals stored in said first storage means to produce difference signals means operatively connected for adding a predetermined proportion of said difference signals to the output signals, of said first storage means to produce a corrected mean value signal, circuit means connected to said adding means and to said second storage means for applying said corrected mean value signal to said second storage means for storage, signal

transfer means operatively connected to said first and second storage means for transferring said corrected mean value signals from said second storage means to said first storage means, and control means operatively connected to sequentially control said first and second storage means and said signal transfer means, whereby signals stored in said first storage means correspond substantially continuously to the mean value of said



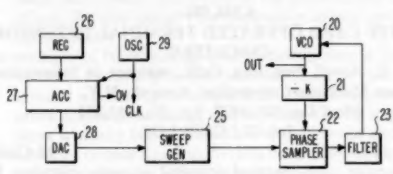
input signals, and wherein said first storage means comprises counter means, said second storage means comprises analog storage means, said means for adding comprising a source of pulses, said system further comprising means responsive to the amplitude of signals stored in said second storage means for controlling the number of pulses applied from said source of pulses to said counter means of said first storage means.

4,144,579

ARITHMETIC SYNTHESIZER FREQUENCY GENERATION WITH REDUCED PHASE JITTER

Edward J. Nossen, Cherry Hill, N.J., and Eugene R. Starner, Bethlehem, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 25, 1977, Ser. No. 818,715
Int. Cl.[2] G06J *1/00;* G06F *15/34;* H03K *4/02*
U.S. Cl. 364—607 **5 Claims**



1. In an arithmetic synthesizer including means for supplying digital signals representing a frequency number, means for supplying clock signals, accumulator means for periodically accumulating said digital signals representing a frequency number to produce digital sum signals having a given modulus, and digital-to-analog conversion means receptive of said digital sum signals for producing analog signals representative of said digital sum signals, the improvement comprising:

output means responsive to said analog signals for producing output signals representing the instantaneous value of the average slope of said digital signals;

said output means including means for mixing said output signals and said digital signals to produce difference signals; and

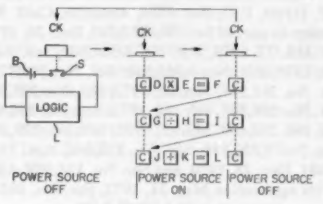
said output means further including sweep generator means responsive to said difference signals for producing said output signals having a linear slope determined by the value of said difference signals.

4,144,580

ELECTRONIC APPARATUS INCORPORATING A POWER SAVINGS FEATURE

Mitsuaki Seki, and Jyuji Kishimoto, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 609,096, Aug. 29, 1975, abandoned. This application Jun. 22, 1977, Ser. No. 808,961
Claims priority, application Japan, Sep. 3, 1974, 49-101177; Sep. 3, 1974, 49-101178
Int. Cl.[2] G06F *3/14, 15/02*
U.S. Cl. 364—707 **24 Claims**



1. Electronic apparatus of the type which performs arithmetic operations in response to entered instructions, comprising:

information input means for entering signals into said apparatus, said input means including a mechanical-electrical energy transducer;

an electrical energy storage means coupled to said input means;

a logic circuit coupled to said storage means for carrying out arithmetic operations in response to the information signals, said logic circuit including at least one persistent logic element operative to hold a memory content when said storage is disconnected; and

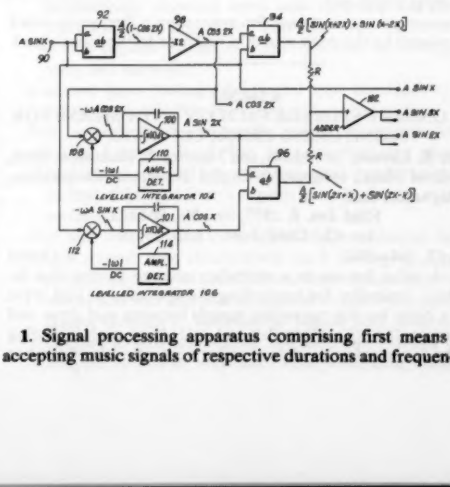
display means coupled to said logic circuit for selectively displaying numerals, letter symbols and the like, said display means including at least one persistent display material operative to hold a display content when said storage means is disconnected.

4,144,581

AUDIO SIGNAL PROCESSOR

Andrew Prudente, 12A Tiffany La., Smithtown, N.Y. 11787

Filed Mar. 25, 1977, Ser. No. 781,143
Int. Cl.[2] G06G *7/22;* G10H *1/06*
U.S. Cl. 364—827 **7 Claims**



1. Signal processing apparatus comprising first means for accepting music signals of respective durations and frequencies

and generating therefrom sinusoidal signals of corresponding durations and frequencies, second means for converting each of said sinusoidal signals into a plurality of harmonics thereof, and third means for respectively attenuating the said harmonics and combining the same, said second means including harmonic generator means responsive to said sinusoidal signals for generating said plurality of harmonics, said third means including a plurality of attenuators for receiving respective of said harmonics and controllably attenuating the same and adder means for adding the thusly attenuated harmonics, said sinusoidal waves being of the form A sin x and said harmonic generator means including means for converting A sin x to A cos 2x, means for converting sin x and A cos 2x into A/2, means for converting A sin x and A cos 2x respectively into A cos x and A sin 2x, means for converting A cos x and A sin 2x into A/2 and means to add A/2 and A/2 to form A sin 3x.

4,144,582

VOICE SIGNAL PROCESSING SYSTEM

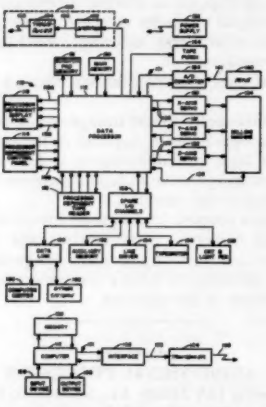
Gilbert P. Hyatt, P.O. Box 4584, Anaheim, Calif. 92803

Continuation-in-part of Ser. No. 752,240, Dec. 20, 1976, Ser. No. 325,933, Jan. 22, 1973, Pat. No. 4,016,540, Ser. No. 325,941, Jan. 22, 1973, Pat. No. 4,060,848, Ser. No. 302,771, Nov. 1, 1972, Ser. No. 291,394, Sep. 22, 1972, Ser. No. 288,247, Sep. 11, 1972, Ser. No. 246,867, Apr. 24, 1972, Ser. No. 230,872, Mar. 1, 1972, Ser. No. 232,459, Mar. 7, 1972, Ser. No. 229,213, Apr. 13, 1972, Pat. No. 3,820,894, Ser. No. 135,040, Apr. 19, 1971, Ser. No. 101,881, Dec. 28, 1970, and Ser. No. 134,958, Apr. 19, 1971.

This application May 31, 1977, Ser. No. 801,879

Int. Cl.[2] G06F *3/00*

U.S. Cl. 364—900 **25 Claims**



1. A sound signal processing system comprising:

input means for generating an input signal in response to an input sound and

Fourier processor means for generating a frequency word related to the input sound in response to the input signal.

4,144,583

SECONDARY STORAGE FACILITY WITH MEANS FOR MONITORING ERROR CONDITIONS

Roger E. Lawson, Northboro, and Maurice A. Richesson, Stow, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 6, 1977, Ser. No. 804,172

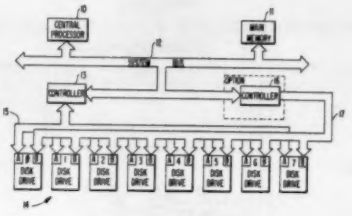
Int. Cl.[2] G06F *3/04, 13/04, 11/06*

U.S. Cl. 364—900 **4 Claims**

1. A drive for use in a secondary storage facility that includes a controller for controlling the operation of said drive and a drive bus for conveying signals between said drive and the controller, the controller and said drive each including means for transferring data therebetween over the drive bus and each including means for transferring control information therebetween over the drive bus, the controller additionally including means for transmitting, concurrently with and independently of other operations in the facility and in cyclic fashion, a sequence of polling signals to the drive over polling lines of the drive bus, said drive comprising:

A. means for monitoring predetermined conditions in said drive,

B. means responsive to said monitoring means for generating a status signal whenever one of the predetermined conditions is changed,



C. means for generating a polling address for said drive,

D. means connected to said polling signal address generating means and connectible to the drive bus for generating a selection signal when the polling signals correspond to the polling address for said drive, and

E. means responsive to the status signal on the selection signal for transmitting an ATTENTION signal onto a corresponding line of the drive bus that is transmitted to the controller.

4,144,584

REMOTE CARD OPERATED TERMINAL EXTENSOR CIRCUITRY

Kenneth E. Powell, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1977, Ser. No. 863,831

Int. Cl.[2] G06F *3/08*

U.S. Cl. 364—900 **18 Claims**

10. Remote card-operated terminal extensor circuitry for accommodating a multiple of such terminals on a transmission line from a central processing station normally accommodating but one such terminal, comprising

a transmission line having a multiple of conductors connected at one end to said central processing station,

said central processing station having at least one digital data input and associated output port leading to component circuitry for processing digital data received at said input port and delivering corresponding data at said output port for transmission to a remote card operated terminal,

said card-operated terminal having a port corresponding to said input and output port of said central processing station and internal circuitry for generating an electric digital signal responsive to said card for transmission over said

transmission line to said central station and for responding to said corresponding data received from said central station,

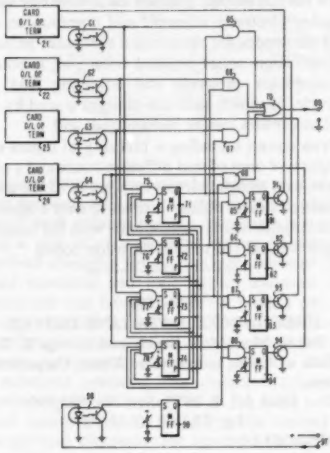
extensor circuitry connected to said transmission line at the other end thereof and connected to a multiple of said code responsive card-operated terminals,

said extensor circuitry comprising

a common reference potential terminal at which like terminals of said card-operated terminals and another conductor of said transmission line are to be connected,

a multiple of optocoupler components having the input circuits thereof connected individually between said output terminals of said card-operated terminals and said common reference potential terminal and having output circuits,

a multiple of retriggerable monostable data-set flip-flop circuits having set terminals individually connected to said output circuits of said optocoupler components, having reset terminals, complementary output terminals, and



clear terminals with the clear terminals and inverted output terminals individually interconnected to form a series linking circuit,

a multiple of NAND gating circuits having output leads connected in common to said transmission line, having input leads individually connected to said output circuits of said optocoupler components, and having arming input leads individually connected to the erect output terminals of said flip-flop circuits corresponding to said optocoupler components,

a multiple of NOR gating circuits having output leads individually connected to said reset terminals of said flip-flop circuits and having two input leads each connected to said erect output terminals of said flip-flop circuits in permutations whereby in conjunction with said series circuit connections of said flip-flop circuits only one flip-flop circuit is activated at any given time,

thereby to isolate all but one of said card-operated terminals from said central processing station at any one time.

4,144,585

BUBBLE DOMAIN STRUCTURES AND METHOD OF MAKING

Irena Puchalska-Hibner, Orsay, France, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation of Ser. No. 452,590, Mar. 19, 1974, abandoned. This application Aug. 16, 1976, Ser. No. 714,546

Int. Cl.[2] H01F *10/02*

U.S. Cl. 365—3 **4 Claims**

1. The method of producing magnetic bubble domains comprising: forming a film of an alloy of 80 to 83.5 percent nickel and the remainder iron and substantially zero constant of magnetostriction by vapor deposition of said alloy in a vacuum of 2×10^{-5} to 2×10^{-6} Torr onto a flat substrate at a substrate temperature in the range of room temperature to 200° C. at an angle of incidence of approximately 60° and to a film thickness of 0.2 μm to 3.0 μm, and subjecting said film to a magnetic field perpendicular to the film of 1600 to 2400 oersteds intensity.

2. A magnetic bubble domain structure comprising: a film of an alloy of 80 to 83.5 percent nickel and the remainder iron and substantially zero constant of magnetostriction formed by vapor deposition of said alloy in a vacuum of 2×10^{-5} to 2×10^{-6} Torr onto a flat substrate at a substrate temperature in the range of room temperature to 200° C. at an angle of incidence of approximately 60° and to a film thickness of 0.2 μm to 3.0 μm, said film being immersed in a magnetic field perpendicular to the film of 1600 to 2400 oersteds intensity.

4,144,586

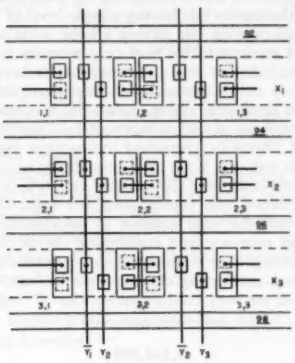
SUBSTRATE-FED INJECTION-COUPLED MEMORY

Aung S. U, Rangoon, Burma, assignor to International Telephone & Telegraph Corp., Nutley, N.J.

Continuation-in-part of Ser. No. 649,305, Jan. 15, 1976, abandoned. This application May 3, 1977, Ser. No. 793,449

Int. Cl.[2] H01L *27/10;* **G11C** *11/40*

U.S. Cl. 365—156 **8 Claims**



1. An integrated injection logic (I^2L) bipolar memory cell which is controlled by read/write-write/read lines and is of the type which may be used in a word-organized array, comprising:

a substrate having a first type semiconductivity forming a common emitter;

a first layer of semiconductive material of a second type conductivity disposed upon said substrate and having therein spaced regions of said first type conductivity, which regions extend downwardly and are contiguous with said substrate;

a second layer having said second type conductivity disposed upon said first layer and said spaced regions;

first, second, third and fourth regions of semiconductive material having said first type conductivity disposed within said epitaxial layer and separated thereby, said first, second, third and fourth regions each having an exposed surface; and

fifth and sixth regions of semiconductive material having said second type conductivity each having an exposed surface, each one of said fifth and sixth regions disposed in one of said first and second regions respectively, said fifth region coupled to said second region, said sixth region coupled to said first region, said third and fourth regions coupled to one of said read/write-write/read lines, and

said contiguous regions each located beneath dead space of said first and second regions.

4,144,587

COUNTING LEVEL "1" BITS TO MINIMIZE ROM ACTIVE ELEMENTS

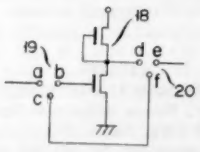
Tadashi Miyakawa, Yokohama; Masayoshi Nakane, Ayase; Masafumi Watanabe, Kawasaki, and Yoshio Osaka, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jul. 22, 1977, Ser. No. 818,015

Claims priority, application Japan, Jul. 22, 1976, 51-87492; Jul. 22, 1976, 51-87502

Int. Cl.[2] G11C *17/00, 7/00*

U.S. Cl. 365—94 **2 Claims**



1. A method of manufacturing a semiconductor binary read only memory device which comprises the steps of counting the number of information bits having a logic level of "1" and the number of information bits having a logic level of "0" to be stored in said semiconductor read only memory device; forming on a semiconductor chip a memory matrix having a plurality of memory cells constructed to represent the "0" logic level, a logic level converting circuit for inverting the logic level of bits read out of said memory, and a connection changeover circuit normally remaining contactless between said memory cells and said logic level converting circuit; forming active elements in those of the memory cells which correspond to the information bits representing the logic level having fewer than half the total number of information bits to be stored in said memory; and connecting the contacts of said connection changeover circuit to connect said memory cells to the logic level converting circuit when the active elements formed in said memory cells represent the "0" logic level.

4,144,588

CCD STORAGE MODULE

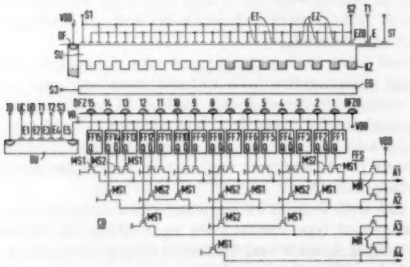
Ernst Göettler, Munich, and Otto Grüter, Krailling, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 1, 1978, Ser. No. 874,200

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1977, 2704711

Int. Cl.[2] G11C *11/40*

U.S. Cl. 365—183 **8 Claims**



1. In a charge coupled device storage module of the type having storage positions which are arranged in cascade and which are formed with the aid of electrodes arranged in insulated fashion above a semiconductor substrate, and of the type wherein, in respect of each storage position, an item of information incoming as a binary number and comprising n bits is stored in that a quantity of charge composed of i unit charges is stored in respect of each storage position, where i corresponds to the value of the binary number of the information, the improvement therein comprising:

analysis means for analyzing the quantity of charge emanating from the last storage position of the cascade of storage positions including

(2^n-1) additional electrodes arranged in insulated fashion above the semiconductor substrate for connection to a first predetermined voltage, the surface of said additional electrodes and said first predetermined voltage dimensioned such that each of said additional electrodes stores one unit charge, so that with an incoming quantity of charge of i unit charges, the i additional electrodes which follow the last storage position each store one unit charge,

a surrender electrode adjacent and common to said additional electrodes for receiving a surrender pulse train,

(2^n-1) diffusion zones isolated from one another in said semiconductor substrate and adjoining said surrender electrode, to which said unit charges stored by said additional electrodes can be transmitted, and

an analysis circuit including a plurality of inputs connected to respective ones of said diffusion zones and a plurality of outputs, said analysis circuit responsive to the unit charges transmitted to said diffusion zones to emit a binary number at said outputs which corresponds with the number of unit charges transmitted to said diffusion zones.

4,144,589

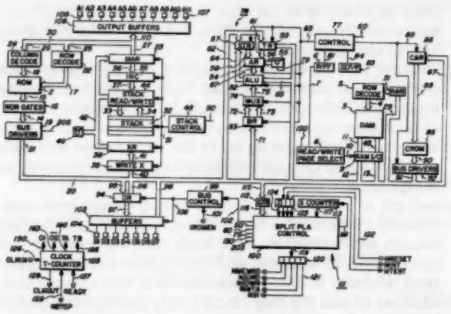
PRECHARGED DATA LINE DRIVER

Lamar T. Baker, Manhattan Beach, and George K. Tu, Rolling Hills, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 8, 1977, Ser. No. 813,999

Int. Cl.[2] G11C *11/40*

U.S. Cl. 365—203 **9 Claims**



1. A circuit responsive to a timing signal and a data signal for discharging a precharged data line to correspond to the data to be transmitted on the data line comprising:

(a) first and second enhancement-type field effect devices connected in series with the drain of said first device being connected to said data line and the source of said second device being connected to ground;

(b) the gate of one of said devices providing an input for said timing signal;

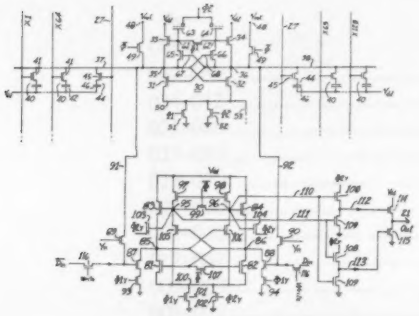
(c) the gate of the remaining device providing an input for said data signal; and

(d) means coupled to the series connection point of said devices for charging said point when said second device is not conducting.

4,144,590
INTERMEDIATE OUTPUT BUFFER CIRCUIT FOR SEMICONDUCTOR MEMORY DEVICE

Norihisa Kitagawa, and Lionel S. White, Jr., both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 29, 1976, Ser. No. 756,921
Int. Cl.[2] G11C *7/06*
U.S. Cl. 365—205 **13 Claims**

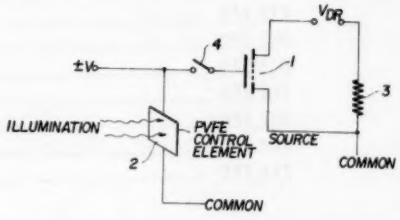


1. A memory system of the type having an aray of rows and columns of memory cells and a sense amplifier positioned at the center of each column line, an intermediate output stage comprising a pair of cross-coupled driver transistors and a precharge/load transistor for each driver transistor, each precharge/load transistor and each driver transistor having a control electrode and having a current path, a pair of sense nodes having capacitance coupled to the column lines one on each side of each sense amplifier, the current paths of the driver transistors separately connecting the sense nodes to one side of a reference potential, the control electrode of each driver transistor being cross-coupled to the sense node for the other driver transistor, means including the current paths of the precharge/load transistors for separately precharging the capacitance of the sense nodes prior to a selected time in an operating cycle, a switching device having a current path connecting the control electrode of each precharge/load transistor to the other side of the reference potential, each switching device having a control electrode, each of the switching devices having its control electrode connected to the opposing sense node, and coupling means for applying a voltage to the control electrodes of the precharge/load transistors at a time subsequent to said selected time.

4,144,591
MEMORY TRANSISTOR

Philip S. Brody, Brookmont, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 824,894, Aug. 15, 1977, Pat. No. 4,051,465, which is a continuation-in-part of Ser. No. 533,305, Dec. 24, 1974, Pat. No. 3,855,004. This application Apr. 5, 1978, Ser. No. 893,567
Int. Cl.[2] G11C *11/22, 11/42*
U.S. Cl. 365—228 **8 Claims**



1. A memory transistor comprising,

a solid state switch means capable of assuming one of two states dependent on the polarity of a bias signal which is to be applied thereto,

a photovoltaic-ferroelectric means for storing information regarding the polarity of said bias signal, which information is stored in the form of a remanent polarization in one of two possible directions,

illumination means for illuminating said photovoltaic-ferroelectric means when it is desired to generate said bias signal, and

means for applying said generated bias signal to said solid state switch means.

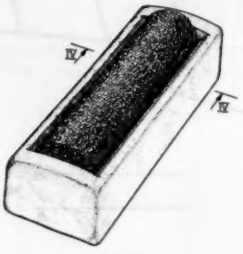
DESIGN PATENTS

GRANTED MAR. 13, 1979

ERRATA

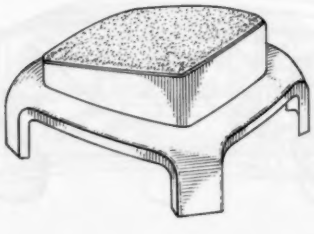
For CLASS	See PATENT NO.
023–052	251,303
024–012	251,304
025–080	251,305
025–080	251,306
025–080	251,307
099–035	251,323
003–030	251,329
018–002	251,330
003–069	251,331
003–077	251,332
003–045	251,333
020–010	251,335

251,276
SNACK FOOD PRODUCT
Charles S. Majeski, 83-18 263rd St., N. Floral Park, N.Y. 11004
Filed Dec. 23, 1976, Ser. No. 753,829
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—24

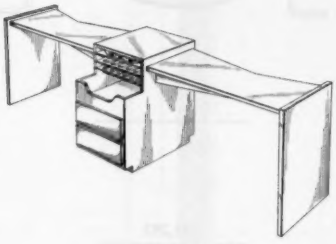


251,277
BOAT CHAIR OR SIMILAR ARTICLE
Eugene M. Kelley, 1796 Larkspur, Pomona, Calif. 91766
Filed Feb. 28, 1977, Ser. No. 772,661
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

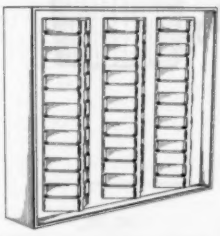
251,278
EXERCISE HASSOCK
Arthur J. Rosenthal, 10908 Etiwanda Ave., Northridge, Calif. 91324
Filed Mar. 7, 1977, Ser. No. 774,995
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—36



251,279
FITTING TABLE
Stephen U. Winig, Narberth, Pa., assignor to American Optical Corporation, Southbridge, Mass.
Filed Aug. 5, 1977, Ser. No. 822,101
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—157



251,280
DISPLAY UNIT FOR EYE-GLASS FRAMES
Stephen U. Winig, Narberth, Pa., assignor to American Optical Corporation, Southbridge, Mass.
Filed Apr. 4, 1978, Ser. No. 893,660
Term of patent 14 years
Int. Cl. D6—*04*; D20—*02*
U.S. Cl. D6—157

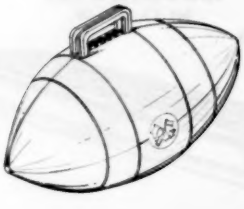


251,281
MODULAR RACK
Robert O. Magnussen, Jr., 20442 Lake Canyon Dr., Walnut, Calif. 91789
Filed May 18, 1977, Ser. No. 797,982
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186

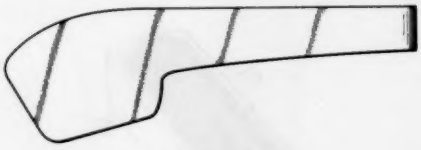
251,282
BREADMAKING MOLD
Reuben Lewis, 105-52 Flatlands 7th St., Brooklyn, N.Y. 11236
Filed Mar. 18, 1977, Ser. No. 779,250
Term of patent 14 years
Int. Cl. D7—*02;* D8—*05*
U.S. Cl. D7—44

251,283
CREAM PITCHER
Adeline M. Nicholas, 1936 Whitman Way, Sacramento, Calif. 95822
Filed Jan. 4, 1977, Ser. No. 756,722
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—64

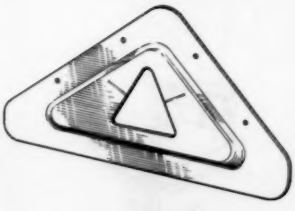
251,284
LUNCH CONTAINER OR SIMILAR ARTICLE
Earl W. Weaver, Rte. 1, Box 72, McIntosh, Ala. 36553
Filed Jan. 6, 1977, Ser. No. 757,337
Term of patent 14 years
Int. Cl. D03—*01*
U.S. Cl. D7—76



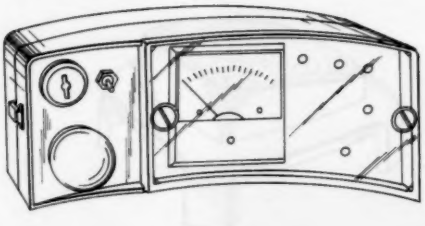
251,285
TEABAG SQUEEZER
Joseph T. Wagner, Sr., Cemetary Rd., Westchester, Colchester, Conn. 06415
Filed Feb. 6, 1976, Ser. No. 655,827
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—105



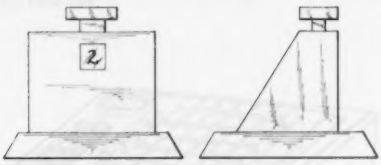
251,286
PICTURE-HANGING BRACKET
Robert D. Cook, 4475 Vieja Dr., Santa Barbara, Calif. 93110
Filed Jul. 25, 1977, Ser. No. 818,466
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—371



251,287
COMBINED NOXIOUS GAS DETECTOR AND MONITORING UNIT
Joseph C. Delfino, 215 Carroll Ave., Mamaroneck, N.Y. 10543, and Sydney Krivin, 14 Elinor Pl., New City, N.Y. 10956
Filed Nov. 29, 1976, Ser. No. 745,662
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—81

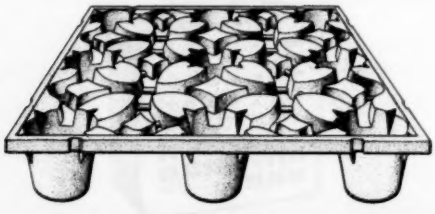


251,288
COUNTER
Helen L. Myers, 1104 Melvin Dr., Portsmouth, Va. 23701
Filed May 23, 1975, Ser. No. 580,188
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—97

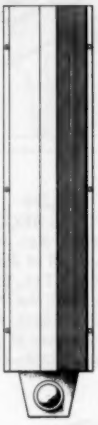


251,289
ORDNANCE VEHICLE
Gerald M. Larson, 21623 Yale, St. Clair Shores, Mich. 48081
Filed Nov. 10, 1976, Ser. No. 740,591
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D12—12

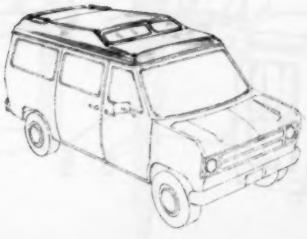
251,290
PALLET
William A. DeGironemo, 850 S. Des Plaines Ave., Forest Park, Ill. 60130
Filed May 16, 1977, Ser. No. 797,596
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D12—53



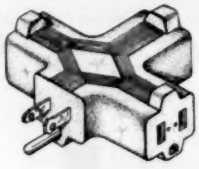
251,291
UNITIZED POWER OUTLET HOUSING FOR A TRUCK BODY
Robert L. Becker, Louisville, Ky., assignor to Dealers Truck Equipment, Inc., Louisville, Ky.
Filed Nov. 3, 1976, Ser. No. 738,303
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—93



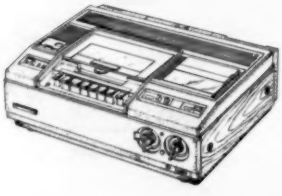
251,292
TOP FOR AN AUTOMOTIVE VAN
William P. Johnson, Syracuse, Ind., and Bruce Remington, Portage, Mich., assignors to Coachmen Industries, Middlebury, Ind.
Filed Apr. 10, 1978, Ser. No. 894,766
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156



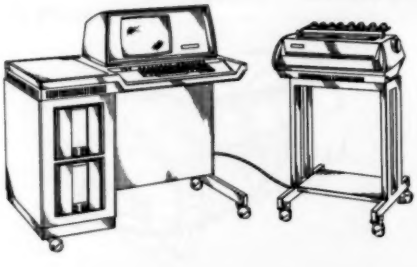
251,293
CONNECTOR
Raymond L. Trueblood, New Carlisle, Ohio, assignor to Trueblood, Inc., Tipp City, Ohio
Filed Apr. 4, 1977, Ser. No. 784,055
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—29



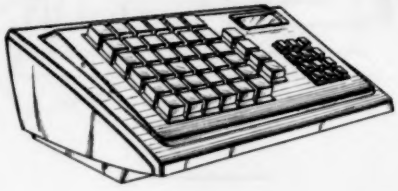
251,294
VIDEO TAPE RECORDER
Shuzo Horikoshi, Kawanishi; Ken Kawamura, Ibaragi, and Kazuhiko Nagata, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Jul. 19, 1977, Ser. No. 817,535
Claims priority, application Japan, Feb. 18, 1977, 52-5490
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—2



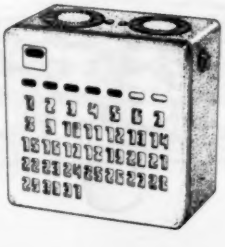
251,295
DISPLAY PROCESSING SYSTEM
Robert M. Wilson, Hayward, and Loren D. Stirling, Pleasanton, both of Calif., assignors to Xerox Corporation, Stamford, Conn.
Filed Jan. 17, 1977, Ser. No. 760,204
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—43



251,296
TELEPHONE INTERCONNECT SYSTEM
David L. Haas, Westport, Conn., assignor to Interconnect Planning Corporation, New York, N.Y.
Filed Mar. 3, 1977, Ser. No. 774,225
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—58



251,297
COMBINED RADIO RECEIVER AND PERPETUAL CALENDAR
Masami Ueda, Nara; Benito Mishiro, Sakai; Toshio Igo, Katano, and Masanori Hamada, Yao, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Jan. 23, 1976, Ser. No. 651,956
Claims priority, application Japan, Sep. 10, 1975, 50-37038
Term of patent 14 years
Int. Cl. D14—*03*; D19—*03*
U.S. Cl. D14—72



251,298

INDOOR RADIO ANTENNA

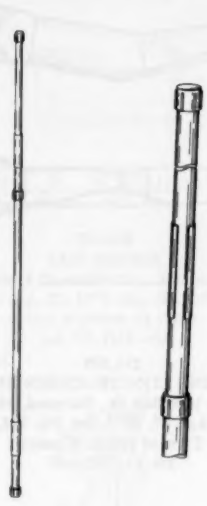
John Altmayer, Cape Coral, Fla., assignor to New-Tronics Corp., Brookpark, Ohio

Filed Apr. 25, 1977, Ser. No. 790,340

Term of patent 14 years

Int. Cl. D14—*06*

U.S. Cl. D14—86



251,299

BOTTLED WATER COOLER STAND

Barbara J. Neel, 2909 Springdale Ave., San Ramon, Calif. 94583

Filed Oct. 29, 1976, Ser. No. 737,042

Term of patent 14 years

Int. Cl. D23—*01;* D15—*07*

U.S. Cl. D15—118

251,300

DUAL POCKET MAILING ENVELOPE BLANK

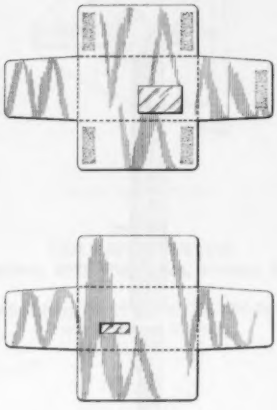
Harold R. Lillibridge, San Mateo, Calif., assignor to Champion International Corporation, Stamford, Conn.

Filed Feb. 28, 1977, Ser. No. 772,729

Term of patent 14 years

Int. Cl. D19—*01*

U.S. Cl. D19—3



251,301

WRITING INSTRUMENT

Jean G. Malamoud, Saint Jorioz, France, assignor to S. T. Dupont, Paris, France

Filed Jul. 18, 1977, Ser. No. 816,458

Claims priority, application France, Jan. 26, 1977, 77 39924

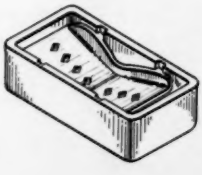
Term of patent 14 years

Int. Cl. D19—*06*

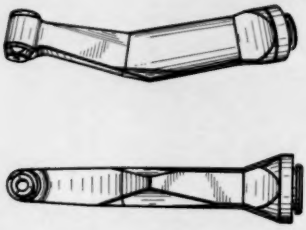
U.S. Cl. D19—49

251,302
WRITING INSTRUMENT
Jean G. Malamoud, Saint Jorioz, France, assignor to S.T. Dupont, Paris, France
Filed Jul. 18, 1977, Ser. No. 816,459
Claims priority, application France, Jan. 26, 1977, 77 39923
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—49

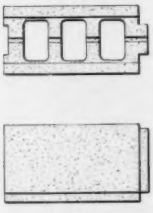
251,303
INFANT'S BATHTUB
Therese C. Boissonneault, 7 Rhode Island Ave., Nashua, N.H. 03060
Filed Jun. 30, 1977, Ser. No. 812,000
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—52



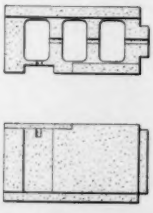
251,304
DENTAL HANDPIECE
Henri Leonard, Besancon, France, assignor to Micro-Mega S.A., France
Filed Apr. 1, 1977, Ser. No. 783,861
Claims priority, application France, Jan. 25, 1977, 77 1136
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—12



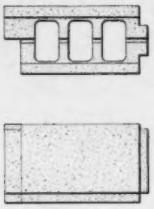
251,305
BUILDING CONSTRUCTION BLOCK
Carmine J. Ceglia, 18 Elliott St., Norwood, Mass. 02062
Filed Apr. 27, 1977, Ser. No. 791,266
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—80



251,306
BUILDING CONSTRUCTION BLOCK
Carmine J. Ceglia, 18 Elliott St., Norwood, Mass. 02062
Filed Apr. 27, 1977, Ser. No. 791,346
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—80

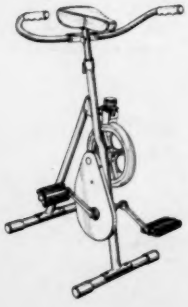


251,307
BUILDING CONSTRUCTION BLOCK
Carmine J. Ceglia, 18 Elliott St., Norwood, Mass. 02062
Filed Apr. 27, 1977, Ser. No. 791,347
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—80

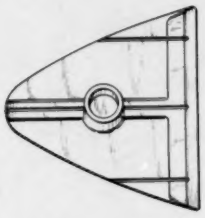


251,308
CUE BRIDGE
King B. Drake, 40489 Carmelita Cir., Temecula, Calif. 92390
Filed Jun. 22, 1977, Ser. No. 808,870
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—232

251,309
EXERCISER
Peter J. Nelson, 6 Yasmar Ave., Haberfield, N.S.W., Australia (2045)
Filed Aug. 26, 1976, Ser. No. 718,030
Claims priority, application Australia, Mar. 5, 1976, 68737
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—194



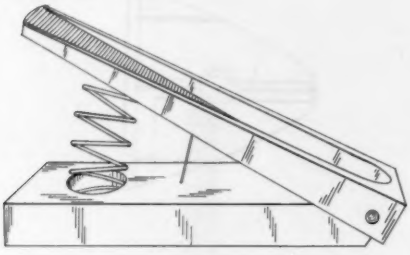
251,310
PUTTER HEAD
Leo J. Paulin, 7315 Wisconsin Ave., Washington, D.C. 20014
Filed Feb. 16, 1977, Ser. No. 769,113
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—219



251,311
GOLF SPOT PUTTER
Albert P. Jackson, 6521 Washington, Windsor Heights, Iowa 50311
Filed May 24, 1977, Ser. No. 800,091
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—217

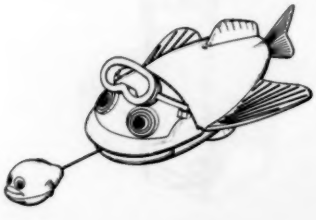
251,312
HOUSING FOR AMUSEMENT WATER TOY
Takao Matsumoto, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Apr. 13, 1977, Ser. No. 787,003
Claims priority, application Japan, Oct. 29, 1976, 51-42780; Oct. 29, 1976, 51-42781; Oct. 29, 1976, 51-42782
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—59

251,313
EXERCISER
Walter J. Jinotti, 10 Scott St., New Brunswick, N.J. 08903
Filed May 16, 1977, Ser. No. 797,447
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D21—194



251,314
FIGURE TOY
Shigeru Saitoh, No. 6-4, 2-chome, Kuramae, Taito-ku, Tokyo, Japan
Filed Feb. 28, 1977, Ser. No. 772,962
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150

251,315
FIGURE TOY
Shigeru Saitoh, No. 6-4, 2-chome, Kuramae, Taito-ku, Tokyo, Japan
Filed Feb. 28, 1977, Ser. No. 772,963
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150



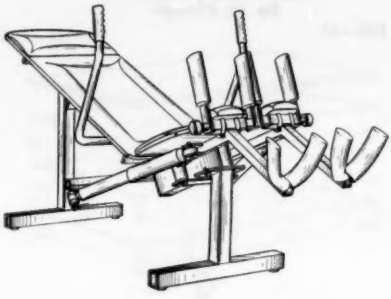
251,316
FIGURE TOY
Shigeru Saitoh, No. 6-4, 2-chome Kuramae, Taito-ku, Tokyo, Japan
Filed Feb. 28, 1977, Ser. No. 772,964
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150

251,317
FIGURE TOY
Shigeru Saitoh, No. 6-4, 2-chome, Kuramae, Taito-ku, Tokyo, Japan
Filed Feb. 28, 1977, Ser. No. 772,965
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150

251,318
FIGURE TOY
Shigeru Saitoh, No. 6-4, 2-chome, Kuramae, Taito-ku, Tokyo, Japan
Filed Feb. 28, 1977, Ser. No. 772,966
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150

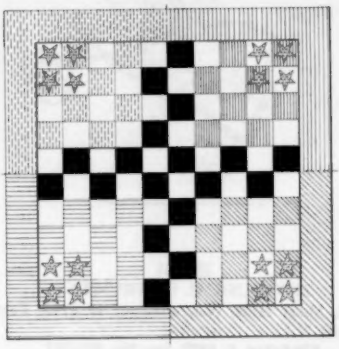
251,319
FIGURE TOY
Shigeru Saitoh, No. 6-4, 2-chome, Kuramae, Taito-ku, Tokyo, Japan
Filed Feb. 28, 1977, Ser. No. 772,967
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150

251,320
PHYSICAL EXERCISER
Jerry D. Brentham, 102 Elm Dr., Belton, Tex. 76513
Filed Nov. 1, 1976, Ser. No. 737,183
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—195

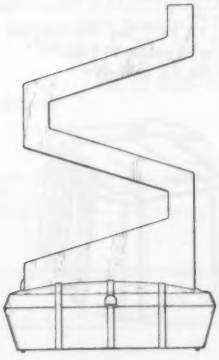


251,321
EXERCISE PLATFORM OR THE LIKE
Israel Barlew, 15212 Cantara, Van Nuys, Calif. 91402
Filed May 2, 1977, Ser. No. 793,160
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—191

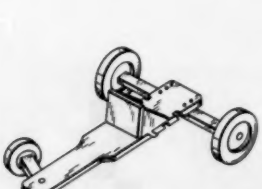
251,322
CHESS GAME BOARD
Gary D. Weiss, P.O. Box 588, Redwood City, Calif. 94062
Filed Jun. 3, 1977, Ser. No. 803,063
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—24



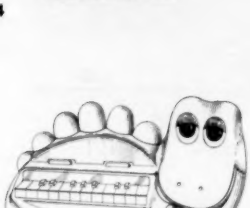
251,323
COIN BANK
Cornelius M. Phipps, 1001 Crescent Blvd., Glen Ellyn, Ill. 60137
Filed Jan. 7, 1977, Ser. No. 757,476
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D99—35



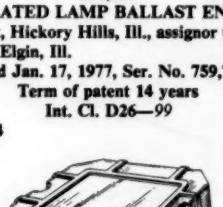
251,324
TOY VEHICLE
Steven D. Vaughn, P.O. Box 1326, Chadron, Nebr. 69337
Filed Nov. 16, 1976, Ser. No. 742,511
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—71



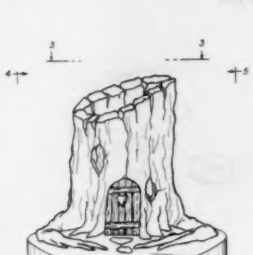
251,325
TOY MUSICAL INSTRUMENT
Mel Appel, Short Hills, N.J., assignor to Proll Toys, Inc., Bloomfield, N.J.
Filed Aug. 5, 1977, Ser. No. 822,242
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—64



251,326
ENCAPSULATED LAMP BALLAST ENCLOSURE
Paul J. Kristofek, Hickory Hills, Ill., assignor to McGraw-Edison Company, Elgin, Ill.
Filed Jan. 17, 1977, Ser. No. 759,750
Term of patent 14 years
Int. Cl. D26—*99*
U.S. Cl. D48—14

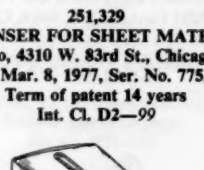


251,327
LAMP
Paul G. Barrett, P.O. Box 40306, Houston, Tex. 77040
Filed Jan. 18, 1977, Ser. No. 759,801
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 C

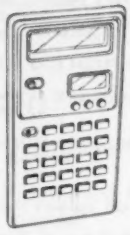


251,328
PERCUSSIVE FLASHLAMP ASSEMBLY
Robert P. Bonazoli, Hamilton, and William H. Morgan, Jr., Assonet, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.
Filed Jul. 5, 1977, Ser. No. 813,109
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D48—33

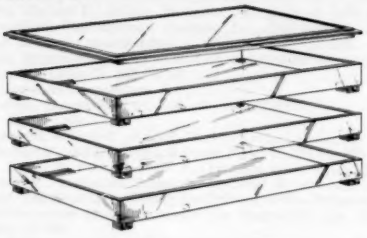
251,329
DISPENSER FOR SHEET MATERIAL
Benny B. Collesano, 4310 W. 83rd St., Chicago, Ill. 60652
Filed Mar. 8, 1977, Ser. No. 775,536
Term of patent 14 years
Int. Cl. D2—*99*
U.S. Cl. D3—30



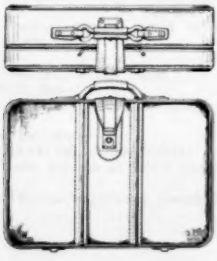
251,330
COMBINED CALCULATOR, CLOCK AND ALARM
Teisuke Kurosu, Chofu; Eiji Fujita, Yokohama; Hisatoshi Matsushima, Yokohama, and Hiroshi Yonekura, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Aug. 17, 1977, Ser. No. 825,509
Claims priority, application Japan, Feb. 17, 1977, 52-5210
Term of patent 14 years
Int. Cl. D18—*01;* D10—*01, 02*
U.S. Cl. D18—2



251,331
PHOTO STORAGE CASE
John G. Russell, Fairfield, and Arthur M. Felske, Westport, both of Conn., assignors to The C. R. Gibson Company, Norwalk, Conn.
Filed Feb. 11, 1977, Ser. No. 767,751
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—69

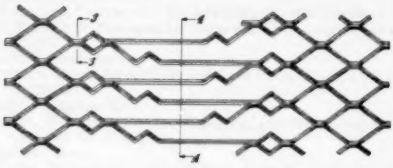


251,332
LUGGAGE CASE
Michael Davis, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.
Filed Dec. 2, 1977, Ser. No. 857,197
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—77

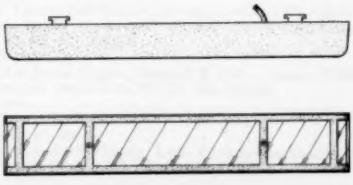


251,333
COMBINED CARRYING CASE AND FOLDING SEAT
Marc Thrift, 105 W. 72nd St., Apartment 12C, New York, N.Y. 10023, and Sonia Linz, 720 Greenwich St., Apartment 6K, New York, N.Y. 10014
Filed Jan. 13, 1977, Ser. No. 758,989
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—45

251,334
EXPANDED METAL SHEET
Orlando A. Jonnum, 12247 Dolan, Downey, Calif. 90242
Filed Apr. 28, 1977, Ser. No. 792,033
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D92—26



251,335
INTERNALLY ILLUMINATED SIGN HOUSING
Vernon J. Carrier, 25830 Viana St., Lomita, Calif. 90717
Filed Aug. 3, 1977, Ser. No. 821,288
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—10



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF MARCH, 1979

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Inc.: *See*—
Cale, Albert D., Jr., 4,144,245, Cl. 260-326.5FL.

A-T-O Inc.: *See*—
Foster, Lloyd L.; Gaarder, Gary D.; and Venzke, Charles E., 4,143,751, Cl. 198-365.000.
Krammer, Robert, deceased, 4,143,599, Cl. 104-172.00S.

AB Alfong Betonghardningsmedel: *See*—
Helgesson, Claes I., 4,144,086, Cl. 106-315.000.

AB Bofors: *See*—
Thunholm, Carl H. G., 4,143,837, Cl. 244-3.220.

AB Castings: *See*—
Axelsson, Gunborg H. V.; and Axgarde, Kristina E. I., 4,143,985, Cl. 403-287.000.

AB Ferrosan: *See*—
Hernestam, Sven E. H.; Nilsson, Nils A.; and Willard, Lars-Olof, 4,144,320, Cl. 424-48.000.

AB Kalle-Regulatorer: *See*—
Kitsnik, Henrik M., 4,143,673, Cl. 137-115.000.

Abbate, Pio J., to Doric Products, Inc. Vault liner reinforcement system. 4,143,494, Cl. 52-139.000.

Abercrombie, William F., Jr., to J. M. Huber Corporation. Method for controlling the viscosity of dispersed clay slurries. 4,144,083, Cl. 106-288.00B.

Abercrombie, William F., Jr., to J. M. Huber Corporation. Method for controlling the viscosity of dispersed clay slurries. 4,144,084, Cl. 106-288.00B.

Abercrombie, William F., Jr., to J. M. Huber Corporation. Method for controlling the viscosity of dispersed clay slurries. 4,144,085, Cl. 106-288.00B.

Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, to American Home Products Corporation. 5-Unsaturated prostanoic acid derivatives. 4,144,251, Cl. 260-343.30P.

Abramson, Harvey J., to Metatech Corporation. Valve for use with a catheter or the like. 4,143,853, Cl. 251-149.100.

Absil, Joseph H.; and Mengelers, Heinrich J., to Stamicarbon, B.V. Process for separating mixtures of particles. 4,144,164, Cl. 209-12.000.

Acevedo, Hernan F.; Slifkin, Malcolm; and Dalbow, Milton H., to International Radioimmune Systems, Inc. Cell test for detecting human chorionic gonadotropin. 4,144,031, Cl. 23-230.00B.

Acevedo, Ignacio. Hand tool with positive-driver but freely-reversible handle. 4,143,693, Cl. 145-76.000.

Acme-Cleveland Corporation: *See*—
Drobnik, Leszek R., 4,143,700, Cl. 164-187.000.

Adams, Jim M.: *See*—
Grimmell, William C.; Adams, Jim M.; Kaetzel, Gilbert C.; Fazzini, Robert P.; and DeZabala, Edward F., 4,143,770, Cl. 209-558.000.

Adams, Lionel B.; Fydelor, Peter J.; Partridge, Gordon; and Pithouse, Kenneth B., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Separators for electrolytic cells. 4,144,301, Cl. 264-126.000.

Adams, Willard L., to Kenzler Engineering Company, Inc. Process of reclaiming used foundry sand. 4,144,088, Cl. 134-2.000.

Adcock, James L.: *See*—
Lagow, Richard J.; Adcock, James L.; and Inoue, Shoji, 4,144,374, Cl. 428-334.000.

Addressograph-Multigraph Corporation: *See*—
Oddo, Eugene P., 4,143,969, Cl. 355-100.000.

Ade, Rolf; Prohaska, Hans; and Schmid, Eckhardt, to ITT Industries, Inc. Fuel supply kit. 4,143,488, Cl. 417-366.000.

Adler, Hansjoerg: *See*—
Mittnacht, Hans; Echte, Adolf; Jenne, Helmut; Lieb, Manfred; Bronstert, Klaus; and Adler, Hansjoerg, 4,144,204, Cl. 260-4.0AR.

Aerazur Constructions Aeronautiques: *See*—
Bernard, Jean P.; and Meningand, Paul A., 4,143,840, Cl. 244-110.00C.

Aftergut, Siegfried; and Cole, Herbert S., Jr., to General Electric Company. Method for improving the response time of a display device utilizing a twisted nematic liquid crystal composition. 4,143,947, Cl. 350-334.000.

Agfa-Gevaert AG.: *See*—
Rauffer, Walter, 4,143,953, Cl. 353-27.00R.

AGFA-GEVAERT N.V.: *See*—
Vermeulen, Leon L.; and Mertens, Ludovicus M., 4,144,064, Cl. 96-29.00L.

Aggregates Equipment, Inc.: *See*—
Arment, Ralph M., 4,143,988, Cl. 404-26.000.

Aghnides, Elie P. Fluidic rotation of tubed screw. 4,143,821, Cl. 239-381.000.

Agnew, George H., to Texaco Exploration Canada Ltd. Method for monitoring underground fluid movement for improving recovery of oil or bitumen. 4,143,714, Cl. 166-252.000.

Aine, Harry E. Solid state transducer and method of making same. 4,144,516, Cl. 338-2.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Murakami, Noboru; Hirosawa, Koichiro; Ohara, Kazuo; and Matsuo, Koichi, 4,143,562, Cl. 74-753.000.

Aitkins, Richard L. Safety sleeve for attachment to the prong of an electrical connector and key for its removal. 4,143,933, Cl. 339-37.000.

Aizawa, Masanori: *See*—
Ueno, Hiroshi; Tsurumaru, Michiko; Otsuka, Shinya; Matsubayashi, Hiroshi; Aizawa, Masanori; Sano, Hiroki; and Suzuki, Yukio, 4,143,790, Cl. 220-458.000.

Akaba, Kunihisa: *See*—
Kudo, Shiro; Ishino, Keizo; and Akaba, Kunihisa, 4,144,358, Cl. 426-582.000.

Akai, Chiaki: *See*—
Hara, Ryoichi; Yajima, Masamichi; Akai, Chiaki; and Matsumoto, Takuzo, 4,143,833, Cl. 242-158.00R.
Hara, Ryoichi; Yajima, Masamichi; Akai, Chiaki; and Matsumoto, Takuzo, 4,143,834, Cl. 242-158.00R.

Akatsu, Mitsuharu: *See*—
Nagasaki, Tadashi; Akatsu, Mitsuharu; and Otsu, Mitsuo, 4,144,480, Cl. 315-411.000.

Akita, Sigeyuki; and Kitagawa, Junji, to Nippon Soken, Inc. Mounting assembly for electric circuit member. 4,144,403, Cl. 174-52.00R.

Akita, Sigeyuki, to Nippon Soken, Inc. Contactless connector circuit. 4,144,485, Cl. 323-44.00R.

Akman, Ahmet R., to Ford Motor Company. Altitude insensitive automotive engine ingnition timing control. 4,143,630, Cl. 123-117.00A.

Aktiebolag • Tudor: *See*—
Sundberg, Erik, 4,144,115, Cl. 156-161.000.

Akutagawa, Susumu: *See*—
Kumobayashi, Hidenori; Akutagawa, Susumu; and Komatsu, Akira, 4,144,257, Cl. 260-410.90R.

Akzona Incorporated: *See*—
McCorsley, Clarence C., III, 4,144,080, Cl. 106-186.000.

Albert, Richard D. Tomographic X-ray scanning system. 4,144,457, Cl. 250-445.00T.

Albrecht, Konrad: *See*—
Frensch, Heinz; Albrecht, Konrad; and Hook, Klaus, 4,144,050, Cl. 71-120.000.

Albrecht, Wolfgang: *See*—
Selden, Peter H.; Albrecht, Wolfgang; and Weissenmayer, Heinz, 4,143,450, Cl. 29-272.000.

Alcolac Inc.: *See*—
Linder, Seymour M.; and Calentine, John W., 4,144,212, Cl. 260-29.70H.

Alexander, Jeffery: *See*—
Zahedi, Karim; Alexander, Jeffery; and Zieve, Peter, 4,144,359, Cl. 427-39.000.

Alkaloida Vegyeszeti Gyar Tiszavasvari: *See*—
Bognar, Reszo; Makleit, Sandor; Kiss, Geza; Berenyi, Sandor; Mile, Terez; Knoll, Jozsef; Elek, Sandor; Gyoker, Istvan; Zoltai, Attila; Toth, Gyorgy; and Litkei, Laszlo, 4,144,236, Cl. 546-46.000.

All States Plastic Manufacturing Co., Inc.: *See*—
Eberhardt, Robert M., 4,143,577, Cl. 85-5.00R.

Allfast, Inc.: *See*—
Luhm, Ralph R., 4,143,580, Cl. 85-77.000.

Allied Chemical Corporation: *See*—
Chen, Ho-Sou; and Polk, Donald E., 4,144,058, Cl. 75-170.000.
Long, E. David, 4,143,621, Cl. 123-32.0EG.
Nagasubramanian, Krishnamurthy; Chlanda, Frederick P.; and Liu, Kang-Jen, 4,144,158, Cl. 204-180.00P.

Almer, Friedrich H. R., to U.S. Philips Corporation. Electric incandescent lamp with cylindrical filament. 4,144,473, Cl. 313-315.000.

Alza Corporation: *See*—
Higuchi, Takeru; and Hussain, Anwar, 4,144,317, Cl. 424-21.000.
Langston, Jimmy B.; Leeper, Harold; and Wong, Patrick S., 4,144,309, Cl. 422-305.000.

Amano, Toshihiko: *See*—
Inoue, Akio; Iwasa, Toshio; Sasaguri, Kiichiro; Amano, Toshihiko; and Nomura, Junji, 4,144,299, Cl. 264-558.000.

Amax Inc.: *See*—
Fusco, Ronald S., 4,144,022, Cl. 432-246.000.

Amende, Dieter V.: *See*—
Schmude, Leonhard; Hasnay, Luan P.; Amende, Dieter V.; and Lettermann, Peter, 4,143,732, Cl. 180-68.00P.

American Cyanamid Company: *See—*
Hoffman, Joseph A.; and Tucker, Robert J., 4,144,029, Cl. 8-180.000.
Luedicke, Oscar B., Jr.; and Gichia, Francis M., 4,144,326, Cl. 424-70.000.
Pensack, Joseph M., 4,144,350, Cl. 424-275.000.
Press, Jeffery B.; and Safir, Sidney R., 4,144,235, Cl. 260-239.30T.

American Home Products Corporation: *See—*
Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 4,144,251, Cl. 260-343.30P.

American Hospital Supply Corporation: *See—*
Goldberg, Allan M.; and Malewicki, Douglas J., 4,143,786, Cl. 215-274.000.

AMP Incorporated: *See—*
Coldren, Daniel R.; and Williams, Benjamin C., 4,144,430, Cl. 200-245.000.

Anbergen, Henricus J. Drowsiness detecting apparatus. 4,144,531, Cl. 340-575.000.

Anderson, Andrew W.; and Rolando, Paul R., to Scandia Packaging Machinery Company. Flat turret transporting mechanism. 4,143,503, Cl. 53-228.000.

Anderson, Bern; and Seiler, Donald W., to United States of America, Navy. Electro-mechanical cipher machine. 4,143,978, Cl. 400-90.000.

Anderson Engineers, Inc.: *See—*
Anderson, Harry E., 4,143,861, Cl. 266-49.000.

Anderson, Gene S., to Belden Corporation. Fiber optic cable and method of making same. 4,143,942, Cl. 350-96.230.

Anderson, Harry E., to Anderson Engineers, Inc. Flame cutting layout. 4,143,861, Cl. 266-49.000.

Anderson, James J.; Camacho, Vasco G.; Kinney, Robert E.; and Seger, Francis M., to Mobil Oil Corporation. Phosphonate flame retardant mixture and resinous foams containing same. 4,144,387, Cl. 521-174.000.

Ando, Yujiro; Ishihara, Shunichi; Murakawa, Shuji; and Ohara, Katsunobu, to Canon Kabushiki Kaisha. Electrophotography method utilizing a photoconductive screen. 4,143,965, Cl. 355-35.00C.

Andrea, Ralph W., III, to Motorola, Inc. Two-way communications system having remote channel selection. 4,144,497, Cl. 325-302.000.

Andreoli, Robert M. Practice tennis racket with racket head insert. 4,143,873, Cl. 273-29.00A.

Andress, Harry J., Jr., to Mobil Oil Corporation. Derivatives of triazole as load-carrying additives for gear oils. 4,144,180, Cl. 252-32.500.

Andrew Corporation: *See—*
Brown, Fred; and Vinezeano, Anthony D., 4,144,510, Cl. 333-241.000.

Andros Incorporated: *See—*
LaForge, David H.; and Portner, Peer M., 4,143,661, Cl. 128-419.00R.

Angelbeck, Albert W.; Mapes, Stuart N.; and Wisner, George R., to United States of America, Navy. Autoalignment system for laser with unstable resonator. 4,144,505, Cl. 331-94.50S.

Anis, Aziz Y. Method and apparatus for accomplishing aphakic correction. 4,143,427, Cl. 3-13.000.

Antonioni, Thomas N., to International Nickel Company, Inc., The. Flash smelting furnace. 4,143,865, Cl. 266-161.000.

Antonov, Oleg K.; Maslov, Valentin T.; and Voitko, Alexei F. Apparatus for combating rolling movements of aircraft. 4,143,839, Cl. 244-76.00R.

Antosh, Leon A. Rebar splice. 4,143,986, Cl. 403-307.000.

Aono, Toshiaki: *See—*
Shiba, Keisuke; Aono, Toshiaki; Hirose, Takeshi; and Shishido, Tadao, 4,144,071, Cl. 96-74.000.

Applied Magnetics Corporation: *See—*
Gibson, George W., 4,143,458, Cl. 29-603.000.

APV Corporation: *See—*
West, Harold H., 4,143,672, Cl. 137-81.000.

Arai, Haruhiko: *See—*
Minegishi, Yutaka; and Arai, Haruhiko, 4,144,177, Cl. 252-8.800.

Arai, Kenichi: *See—*
Fujimoto, Hirohisa; Suzuki, Norihiko; Shibazaki, Kenji; and Arai, Kenichi, 4,143,570, Cl. 83-205.000.

Araki, Kunio; Makuuchi, Keizo; Takagi, Tohru; and Nakayama, Hiroyuki, to Japan Atomic Energy Research Institute; and Kansai Paint Co., Ltd. Radiation process for producing a reactive aqueous emulsion. 4,144,155, Cl. 204-159.220.

Ardezzone, Frank J.; and Verhoeven, Arthur P., to Probe-Rite, Inc. Inker network for probing machine. 4,144,536, Cl. 346-33.00F.

Argelich, Termes Y Cia., S.A.: *See—*
Trullas, Isidro F., 4,143,527, Cl. 68-18.00F.

Armco Steel Corporation: *See—*
Martin, Mulford, Jr.; and Richter, Donald W., 4,143,498, Cl. 52-489.000.

Arment, Ralph M., to Aggregates Equipment, Inc. Manhole riser. 4,143,988, Cl. 404-26.000.

Armond, John W.; and Ray, Martyn S., to Boc Limited. Gas separation. 4,144,037, Cl. 55-58.000.

Armond, John W., to BOC Limited. Gas separation. 4,144,038, Cl. 55-58.000.

Armstrong Cork Company: *See—*
Lewis, Robert D., 4,144,366, Cl. 428-88.000.

Arnold, Robert A.: *See—*
Matthews, Gary J.; and Arnold, Robert A., 4,144,397, Cl. 562-466.000.

Arns, Harold E.: *See—*
Burdorf, Donald L.; Bjordahl, James; Kincel, Roger S.; and Arns, Harold E., 4,144,549, Cl. 360-78.000.

Arthur, Jett C., Jr.: *See—*
Mod, Robert R.; Harris, James A.; Arthur, Jett C., Jr.; Magne, Frank C.; Sumrell, Gene; and Novak, Arthur F., 4,144,256, Cl. 260-402.500.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Inoue, Akio; Iwasa, Toshio; Sasaguri, Kiichiro; Amano, Toshihiko; and Nomura, Junji, 4,144,299, Cl. 264-558.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Kubota, Toshifumi, 4,143,945, Cl. 350-214.000.
Takahashi, Yasuo, 4,143,944, Cl. 350-214.000.

Asahimatsu Koridofu Kabushiki Kaisha: *See—*
Kudo, Shiro; Ishino, Keizo; and Akaba, Kunihisa, 4,144,358, Cl. 426-582.000.

Asaumi, Hiroshi: *See—*
Otouma, Takashi; Asaumi, Hiroshi; Kubota, Kazuo; and Yamamoto, Mitsuo, 4,144,121, Cl. 162-145.000.

Aschiero, Roland: *See—*
Sundt, Erling; and Aschiero, Roland, 4,144,200, Cl. 252-522.000.

Ascoli, Enzo, to Gillette Company, The. Manually operated electrical switch. 4,144,429, Cl. 200-164.00R.

Ashcraft, Arnold C.; Turbett, Robert J.; and Burke, Timothy R., to Union Carbide Corporation. Dielectric compositions comprising ethylene polymer stabilized against water treeing with epoxy containing organo silanes. 4,144,202, Cl. 252-63.200.

Ashida, Akira: *See—*
Suzaki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takahashi, Kiyoshi; and Takimoto, Hiroyuki, 4,143,951, Cl. 352-169.000.

Askew, Herbert F.: *See—*
Jayne, Gerald J. J.; and Askew, Herbert F., 4,144,247, Cl. 260-329.00P.

Askins, William E.: *See—*
Souza, Anthony J.; and Askins, William E., 4,143,741, Cl. 182-198.000.

Astronics Corporation: *See—*
Kerr, Charles, III; and Krause, Daniel V., 4,144,557, Cl. 362-84.000.

Atencio, Francisco J. G. Dam with movable hydroelectric assembly. 4,143,990, Cl. 405-78.000.

Atlantic Research Corporation: *See—*
Kitchens, Judith A. F., 4,144,152, Cl. 204-158.00R.

Atlantic Richfield Company: *See—*
Baillie, Lloyd A., 4,143,539, Cl. 73-7.000.
Chambers, Robert R.; and Wohlmut, Peter G., 4,144,097, Cl. 136-89.0PC.
DeJovine, James M., 4,144,166, Cl. 210-60.000.
Sheng, Ming N.; and Kao, Jar-lin, 4,144,399, Cl. 562-598.000.

Atlow Mining Development Consultants Limited: *See—*
Dawson, Gordon B., 4,143,919, Cl. 299-59.000.

Auer, Eberhard: *See—*
Zoller, Karl; Werner, Dietmar; and Auer, Eberhard, 4,144,260, Cl. 260-448.00R.

Augustin, Hubert; Friesenbichler, Eduard; and Moser, Alfred, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Process for producing a component part of a railway switch or a railway crossing and component part of railway switches or railway crossings produced by such process. 4,144,442, Cl. 219-106.000.

Auhorn, Werner: *See—*
Scharf, Emil; Fikentscher, Rolf; Auhorn, Werner; and Streit, Werner, 4,144,123, Cl. 162-164.00R.

Auinger, Herbert, to Siemens Aktiengesellschaft. Pole changeable three phase winding. 4,144,470, Cl. 310-198.000.

Automatic Sprinkler Limited: *See—*
Bouman, Willem J., 4,143,535, Cl. 72-119.000.

Automation Industries, Inc.: *See—*
Martens, George D.; and Hendricks, T. B., 4,143,553, Cl. 73-625.000.

Automotive Products Limited: *See—*
Young, Alastair J., 4,143,925, Cl. 303-22.00R.

Autotronic Controls Corporation: *See—*
Peck, Gordon H., 4,143,633, Cl. 123-148.00E.

Avtex Fibers Inc.: *See—*
Smith, Frederick R., 4,144,079, Cl. 106-164.000.

Awalt, Thomas Y., Jr. Storage for heat and cold. 4,143,705, Cl. 165-18.000.

Awano, Takeshi: *See—*
Sakakibara, Yosihiro; and Awano, Takeshi, 4,143,911, Cl. 297-341.000.

Axelsson, Gunborg H. V.; and Axgarde, Kristina E. I., to AB Castings. Pile connecting device. 4,143,985, Cl. 403-287.000.

Axgarde, Kristina E. I.: *See—*
Axelsson, Gunborg H. V.; and Axgarde, Kristina E. I., 4,143,985, Cl. 403-287.000.

B. F. Goodrich Company, The: *See—*
Cohen, Louis, 4,144,307, Cl. 422-131.000.

Baatz, Rolf: *See—*
Hoehne, Klaus; Jelen, Johann; Heine, Diez; and Baatz, Rolf, 4,144,203, Cl. 260-3.300.

Babb, Burton A., to Babbco, Ltd. Unitary tuned port and loudspeaker frame. 4,144,416, Cl. 179-115.500.

Babbco, Ltd.: *See—*
Babb, Burton A., 4,144,416, Cl. 179-115.500.

Babcock & Wilcox Company, The: *See—*
Barsin, Joseph A.; Marshall, David M.; and Pirsh, Edward A., 4,144,017, Cl. 431-10.000.

Bachmann, Peter, to Ebauches Bettlach S.A. Shock-absorbing bearing for timepiece movements. 4,143,511, Cl. 58-140.00A.

Backx, Leo J. J.: *See—*
Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph H., 4,144,346, Cl. 424-273.00R.

Badmin, John S.: *See—*
Felton, John C.; and Badmin, John S., 4,144,331, Cl. 424-219.000.

Bagli, Jehan F.: *See—*
Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 4,144,251, Cl. 260-343.30P.

Baillie, Lloyd A., to Atlantic Richfield Company. Apparatus and method for determining the attrition properties of a mass of solid particles. 4,143,539, Cl. 73-7.000.

Baker, Lamar T.; and Tu, George K., to Xerox Corporation. Precharged data line driver. 4,144,589, Cl. 365-203.000.

Baker, Lamar T.: *See—*
Tu, George K.; Baker, Lamar T.; Markle, Robert E.; and Mager, George E., 4,144,561, Cl. 364-200.000.

Baldwin, John J.; and Ponticello, Gerald S., to Merck & Co., Inc. Heterocycle substituted (3-loweralkylamino-2-R_1O-propoxy)pyridines. 4,144,343, Cl. 424-263.000.

Ball, Vincent W.: *See—*
Levy, Marilyn; and Ball, Vincent W., 4,143,971, Cl. 356-404.000.

Balloni, Riccardo; Buzio, Pierpaolo; and Galli, Vito, to Societa Italiana Resine S.I.R. S.p.A. Process for coating polyolefin films. 4,144,363, Cl. 427-322.000.

Balser, Martin, to Xonics, Inc. Method and apparatus for remote measurement of variation in wind velocity. 4,143,547, Cl. 73-170.00R.

Bangs, Sonia W.: *See—*
Chamberlin, Thomas A.; and Bangs, Sonia W., 4,144,211, Cl. 260-29.20R.

Baranov, Mikhail I.: *See—*
Khimenko, Lev T.; Mezhuev, Alexandr T.; Legeza, Anatoly V.; Sljusarev, Andrei K.; Gavrjuschenko, Anatoly D.; Chudakov, Vyacheslav A.; and Baranov, Mikhail I., 4,143,532, Cl. 72-56.000.

Barker, Dean L.: *See—*
Loree, Thomas R.; and Barker, Dean L., 4,144,464, Cl. 307-88.300.

Barr, James W., Jr., to Sterling Drug, Inc. Reverse flow heat exchangers. 4,143,702, Cl. 165-1.000.

Barreau, Michel; Cotrel, Claude; and Jeanmart, Claude, to Rhone-Poulenc Industries. 1,2-Dithiole pyrimidines. 4,144,339, Cl. 424-251.000.

Barsin, Joseph A.; Marshall, David M.; and Pirsh, Edward A., to Babcock & Wilcox Company, The. Pulverized coal combustor. 4,144,017, Cl. 431-10.000.

BASF Aktiengesellschaft: *See—*
Boell, Walter; and Koenig, Horst, 4,144,239, Cl. 546-301.000.
Bronstert, Bernd; Lenz, Werner; Hartmann, Heinrich; Werther, Heinz-Ulrich; and Zuerger, Manfred, 4,144,073, Cl. 96-115.00P.
Burdorf, Donald L.; Bjordahl, James; Kincel, Roger S.; and Arns, Harold E., 4,144,549, Cl. 360-78.000.
Fischer, Adolf, deceased, 4,144,048, Cl. 71-92.000.
Kuesters, Werner; Jacobi, Manfred; and Osterloh, Rolf, 4,144,156, Cl. 204-159.230.
Leutner, Bernd; Scizi, Gotthard; Lukas, Siegmar; Schreiner, Siegfried; and Voelkl, Erfried, 4,144,146, Cl. 204-92.000.
Mittnacht, Hans; Echte, Adolf; Jenne, Helmut; Lieb, Manfred; Bronstert, Klaus; and Adler, Hansjoerg, 4,144,204, Cl. 260-4.0AR.
Scharf, Emil; Fikentscher, Rolf; Auhorn, Werner; and Streit, Werner, 4,144,123, Cl. 162-164.00R.
Selden, Peter H.; Albrecht, Wolfgang; and Weissenmayer, Heinz, 4,143,450, Cl. 29-272.000.
Zoller, Karl; Werner, Dietmar; and Auer, Eberhard, 4,144,260, Cl. 260-448.00R.

BASF Wyandotte Corporation: *See—*
Murphy, John R.; and Pizzini, Louis C., 4,144,395, Cl. 560-200.000.

Bastian, Jean-Michel, to Sandoz Ltd. 1,4-Substituted piperazinyl derivatives useful as psychostimulants. 4,144,337, Cl. 424-250.000.

Bauer, Dan O.; and Heintz, Richard P., to Pneumo Corporation. Redundant EHV fault detector. 4,143,583, Cl. 91-1.000.

Bauer, Wolfgang; and Ribka, Joachim, to Cassella Aktiengesellschaft. Soluble trisazo dyestuffs containing a 2-phenyl-benzimidazolyl, -benzoxazolyl or -benzthiazolyl middle component. 4,144,230, Cl. 260-157.000.

Bauer, Wolfgang; and Ribka, Joachim, to Cassella Aktiengesellschaft. Soluble trisazo dyestuffs containing a 2-phenyl-benzimidazolyl, -benzoxazolyl or -benzthiazolyl middle component. 4,144,231, Cl. 260-157.000.

Baumoel, Joseph. Single transducer liquid level detector. 4,144,517, Cl. 340-1.00L.

Bausch & Lomb Incorporated: *See—*
Chen, Richard Y., 4,143,949, Cl. 351-160.00H.

Baxter, Charles A. R.; and Shroot, Braham, to Pfizer Inc. Substituted mercaptothiadiazole compounds. 4,144,240, Cl. 260-302.0SD.

Bayer Aktiengesellschaft: *See—*
Casper, Rudolf; Nolte, Wilfried; and Braese, Hans, 4,144,286, Cl. 260-876.00R.
Dieterich, Dieter; and Markusch, Peter, 4,144,267, Cl. 260-505.00R.
Dorlars, Alfons; and Schellhammer, Carl-Wolfgang, 4,144,243, Cl. 260-308.00A.
Fiege, Helmut; Haydn, Josef; Renner, Johann; and Wedemeyer, Karlfried, 4,144,400, Cl. 568-788.000.
Germerdonk, Rolf; Borger, Gotz-Gerald; and Huning, Werner, 4,144,313, Cl. 423-210.000.
Grosche, Michael; Hofer, Roland; and Stuwe, Arnd, 4,144,311, Cl. 423-155.000.
Hildebrand, Dietrich; and Gribnau, Thomas, 4,144,128, Cl. 195-63.000.
Hoehne, Klaus; Jelen, Johann; Heine, Diez; and Baatz, Rolf, 4,144,203, Cl. 260-3.300.
Mitschke, Karl-Heinz, 4,144,290, Cl. 260-986.000.
Mitschke, Karl-Heinz; and Boehmke, Gunther, 4,144,291, Cl. 260-986.000.

BBC Brown, Boveri & Company, Limited: *See—*
Bollhalder, Heinz; and Sova, Vladimir, 4,144,149, Cl. 204-149.000.
Gaiffi, Sevi; Menth, Anton; and Nagel, Harmut, 4,144,105, Cl. 148-103.000.
Melton, Keith; and Mercier, Olivier, 4,144,057, Cl. 75-134.00C.

Bean, Lloyd F., to Xerox Corporation. Transfer development using a fluid spaced donor member. 4,144,061, Cl. 96-1.0SD.

Beaucamp, Klaus: *See—*
Gruber, Wolfgang; Bergmeyer, Hans U.; Nelbock-Hochstetter, Michael; Beaucamp, Klaus; Holz, Gunter; Gramsall, Johanna; and Lang, Gunter, 4,144,129, Cl. 195-66.00R.

Beaulieu, Adrian A., to Vapor Corporation. High temperature thermal storage system utilizing solar energy units. 4,143,642, Cl. 126-271.000.

Beck, Warren R., to Minnesota Mining and Manufacturing Company. Low-density space-filling sheet material. 4,144,372, Cl. 428-283.000.

Becker, Phillip D., to Buell Industries, Inc. Capped machine nut and method of manufacture. 4,143,578, Cl. 85-35.000.

Beckman Instruments, Inc.: *See—*
Schwab, Christopher M., 4,144,482, Cl. 318-381.000.

Beckmann, Rolf; and Knackstedt, Wilhelm, to Dynamit Nobel Aktiengesellschaft. Process for the production of modified, partially acetalized polyvinyl alcohol films. 4,144,376, Cl. 428-429.000.

Beecham Group Limited: *See—*
Burbidge, Colin, 4,144,126, Cl. 195-1.100.

Behavioral Controls, Inc.: *See—*
Cohen, Ronald S.; and Dawley, James M., 4,143,648, Cl. 128-1.00R.

Beiersdorf Aktiengesellschaft: *See—*
Guse, Gunter; Lukat, Ernst; Jauchen, Peter; Lenck, Wolfdieter; and Pietsch, Hanns, 4,144,157, Cl. 204-159.230.

Beitner, Shlomo, to Bipol Ltd. Portable refrigerator unit. 4,143,711, Cl. 165-185.000.

Belden Corporation: *See—*
Anderson, Gene S., 4,143,942, Cl. 350-96.230.

Bell & Howell Company: *See—*
Karsh, Herbert; and Norton, J. Clyde, 4,143,538, Cl. 73-2.000.

Bell Telephone Laboratories, Incorporated: *See—*
Dragone, Corrado, 4,144,535, Cl. 343-756.000.
Frenkiel, Richard H., 4,144,411, Cl. 179-2.0EB.
Holtz, Roger E.; Tilson, Bernard A.; and Woods, Gordon D., 4,144,408, Cl. 179-16.00E.
O'Neill, John F., 4,144,525, Cl. 340-347.0AD.
Pharney, Julian R., 4,144,487, Cl. 324-52.000.

Belloci, Rio, to Pont-a-Mousson S.A. Process and device for controlling a vessel for pouring liquid under low pressure in a repeated manner. 4,143,687, Cl. 141-1.000.

Beltran, Adrian M.; and Schilling, William F., to General Electric Company. Claddings of high-temperature austenitic alloys for use in gas turbine buckets and vanes. 4,144,380, Cl. 428-679.000.

Beningson, Herbert E.: *See—*
Lyshkow, Norman A.; Beningson, Herbert E.; and Di Ruocco, Camillo V., 4,144,019, Cl. 431-173.000.

Bennecke, Earl J.; and Bennecke, Mark R. Industrial liquid cleansing apparatus. 4,144,172, Cl. 210-525.000.

Bennecke, Mark R.: *See—*
Bennecke, Earl J.; and Bennecke, Mark R., 4,144,172, Cl. 210-525.000.

Bennett Pollution Controls, Ltd.: *See—*
Welsh, Howard, 4,143,987, Cl. 403-348.000.

Bennett, Robert A. Valve stem button. 4,143,822, Cl. 239-490.000.

Benson, Bernard A., to Boeing Construction Equipment Company. Combustion control system for bituminous drum mixers. 4,143,972, Cl. 366-25.000.

Berenyi, Sandor: *See—*
Bognar, Reszo; Makleit, Sandor; Kiss, Geza; Berenyi, Sandor; Mile, Terez; Knoll, Jozsef; Elek, Sandor; Gyoker, Istvan; Zoltai, Attila; Toth, Gyorgy; and Litkei, Laszlo, 4,144,236, Cl. 546-46.000.

Bereuter, Heinz. Salts of alkylenediamine carboxylic acids and aqueous solutions thereof. 4,144,182, Cl. 252-34.000.

Bergen, Gary R., to Emhart Industries, Inc. Fire shielded doorlatch knob assembly for locksets. 4,143,897, Cl. 292-347.000.

Bergens, Torsten E. Conveying arrangement. 4,143,753, Cl. 198-370.000.

Berges, David A., to SmithKline Corporation. 5-Sulfomethyl-1,3,4-thiadiazole-2-thiol. 4,144,241, Cl. 260-302.50D.

Bergman, Jan: *See—*
Van Hijfte, Herman M.; and Bergman, Jan, 4,144,533, Cl. 343-7.0AG.

Bergman, Raymond A. Centering pin for air float machine tool tables. 4,143,868, Cl. 269-20.000.

Bergmann, Richard L., to Ranco Incorporated. Adjustable condition responsive control. 4,144,515, Cl. 337-319.000.

Bergmeyer, Hans U.: *See—*
Gruber, Wolfgang; Bergmeyer, Hans U.; Nelbock-Hochstetter, Michael; Beaucamp, Klaus; Holz, Gunter; Gramsall, Johanna; and Lang, Gunter, 4,144,129, Cl. 195-66.00R.

Bergomi, Angelo; and Tazuma, James J., to Goodyear Tire & Rubber

Company, The. Method of preparing tetraalkyl thiuram disulfides. 4,144,272, Cl. 260-567.000.
Berkowitz, Murray, to Curtiss-Wright Corporation. Bar type seal for rotary mechanism. 4,144,003, Cl. 418-113.000.
Bernard, Jean P.; and Meningand, Paul A., to Aerazur Constructions Aeronautiques. Arrester net gear for aircraft. 4,143,840, Cl. 244-110.00C.
Bernard, Vincent E.: *See*—
Everman, Wayne F.; and Bernard, Vincent E., 4,143,773, Cl. 414-787.000.
Berner, John M.: *See*—
Nichols, Joseph C.; Berner, John M.; and Fernandez, Mario F., 4,143,576, Cl. 84-318.000.
Berol Kemi AB: *See*—
Emanuelsson, Jan G.; and Wahlen, Svante L., 4,144,122, Cl. 162-158.000.
Berthiaume, Camille J., to Columbia Chase Corporation. Combustion process. 4,144,015, Cl. 431-8.000.
Bethell, Michael R.: *See*—
West, Burke A.; and Bethell, Michael R., 4,143,729, Cl. 180-5.00R.
Bhattacharya, Bishnu P. Manual control device for automotive vehicle. 4,143,734, Cl. 180-77.00R.
Biax-Fiberfilm Corporation: *See*—
Schwarz, Eckhard C. A., 4,144,008, Cl. 425-66.000.
Bible, Harley V., to Robertshaw Controls Company. Process machinery control system and individual safety control systems therefor or the like. 4,143,616, Cl. 116-266.000.
Biedermann, Helmut. Stilligout or dropper particularly for infusion apparatus. 4,143,659, Cl. 128-214.00C.
Bienfait, Henri P. Apparatus for delivering newspapers, magazines and similar articles. 4,143,791, Cl. 221-75.000.
Bipol Ltd.: *See*—
Beitner, Shlomo, 4,143,711, Cl. 165-185.000.
Birkle, Siegfried; Dotzer, Richard; and Rissel, Eva, to Siemens Aktiengesellschaft. Method for the currentless catalytic precipitation of aluminum. 4,144,360, Cl. 427-123.000.
Bjerklie, John W.: *See*—
LaHaye, Paul G.; Bjerklie, John W.; and Gallant, Gerald G., Jr., 4,144,020, Cl. 432-19.000.
Bjordahl, James: *See*—
Burdorf, Donald L.; Bjordahl, James; Kincel, Roger S.; and Arns, Harold E., 4,144,549, Cl. 360-78.000.
Blackman Martin Group Limited: *See*—
Oxenham, John, 4,143,571, Cl. 83-412.000.
Blanc, Claude; Chenard, Jean-Yves; and Oliveau, Olivier, to Societe Nationale Elf Aquitaine (Production). Selective absorption process of hydrogen sulphide and sulphur containing compounds from a gaseous mixture. 4,144,039, Cl. 55-73.000.
Blanc, Claude G.: *See*—
Gerin, Albert A.; and Blanc, Claude G., 4,143,643, Cl. 126-271.000.
Blanc, Roger, to Garmont S.p.A. Skiboot. 4,143,474, Cl. 36-120.000.
Blanc, Yale A., to Martin Yale Industries, Inc. Apparatus for agitating and polishing materials. 4,143,491, Cl. 51-163.100.
Blessing, Hubert, to Levi Strauss & Company. Facing ply separator. 4,143,871, Cl. 271-10.000.
Block, Jacob, to United States of America, Interior. Method and composition for removing calcium sulfate scale deposits from surfaces. 4,144,185, Cl. 252-180.000.
Blue Wing Corporation: *See*—
Rawlings, Robert M.; and Procter, Donald, 4,144,355, Cl. 426-2.000.
Blum, Albert. Suction pump with rotatable flow retaining and repelling element. 4,143,993, Cl. 415-121.00B.
Blumberg, Sidney. Self-contained exhaust hood with heat exchanger and method of exhausting air. 4,143,645, Cl. 126-299.00D.
Boc Limited: *See*—
Armond, John W.; and Ray, Martyn S., 4,144,037, Cl. 55-58.000.
Armond, John W., 4,144,038, Cl. 55-58.000.
Bodnar, Alfred D.: *See*—
Williams, Alverson B.; and Bodnar, Alfred D., 4,143,887, Cl. 280-697.000.
Boehmke, Gunther: *See*—
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Boehringer Mannheim GmbH: *See*—
Gruber, Wolfgang; Bergmeyer, Hans U.; Nelbock-Hochstetter, Michael; Beaucamp, Klaus; Holz, Gunter; Gramsall, Johanna; and Lang, Gunter, 4,144,129, Cl. 195-66.00R.
Boeing Construction Equipment Company: *See*—
Benson, Bernard A., 4,143,972, Cl. 366-25.000.
Boell, Walter; and Koenig, Horst, to BASF Aktiengesellschaft. Manufacture of pyridoxin. 4,144,239, Cl. 546-301.000.
Bognar, Reszo; Makleit, Sandor; Kiss, Geza; Berenyi, Sandor; Mile, Terez; Knoll, Jozsef; Elek, Sandor; Gyoker, Istvan; Zoltai, Attila; Toth, Gyorgy; and Litkei, Laszlo, to Alkaloida Vegyeszeti Gyar Tiszavasvari. 6-Deoxy-6-azido-14-hydroxy-7,8-dihydroisomorphine or a pharmaceutically acceptable salt thereof. 4,144,236, Cl. 546-46.000.
Bogri, Tibor: *See*—
Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 4,144,251, Cl. 260-343.30P.
Bohner & Kohle GmbH & Co.: *See*—
Bosch, Walter, 4,143,533, Cl. 72-68.000.
Boise Cascade Corporation: *See*—
McCulloch, Roger L., 4,143,768, Cl. 206-590.000.
Boje, Jurgen; Bratengeier, Horst; Zaveta, Karel; and Schumann, Gunter, to Messer Griesheim GmbH. Current collector. 4,143,929, Cl. 339-5.00M.
Bolhofer, William A., to Merck & Co., Inc. N-pyrimidinyl-N-dialkylaminoalkyl ureas. 4,144,338, Cl. 424-251.000.
Boliden Aktiebolag: *See*—
Petersson, Stig A.; and Eriksson, Bengt S., 4,144,055, Cl. 75-73.000.
Bollhalder, Heinz; and Sova, Vladimir, to BBC Brown, Boveri & Company, Limited. Method for working up aqueous residues from metallizing baths. 4,144,149, Cl. 204-149.000.
Boltizar, Pal: *See*—
Noack, Christian; Oliva, Klaus; Eistert, Theodor; Zumpf, Bernd; Spaida, Hans P.; John, Gunter; Pietschmann, Frank; Boltizar, Pal; Fabry, Istvan; Vida, Csongor; Lakos, Lajos; and Klement, Matyas, 4,143,504, Cl. 56-98.000.
Boltze, Karl-Heinz; Seidel, Peter-Rudolf; Jacobi, Haireddin; and Schwarz, Helmut, to Troponwerke Dinklage & Co. 2-Benzopyranone derivatives, process for their production, their use as medicaments, more especially as coronary dilators. 4,144,336, Cl. 424-248.540.
Bona, Edmond, to Droguet International. Method of, and device for, rapidly threading perforated articles onto a rod, in particular a rod of a display unit. 4,143,772, Cl. 211-59.100.
Bond, George S. Omni-directional photographic illumination apparatus. 4,144,556, Cl. 362-16.000.
Booi, Arie, to Repla Designs Limited. Window frame structure. 4,143,493, Cl. 52-127.000.
Borger, Gotz-Gerald: *See*—
Germerdonk, Rolf; Borger, Gotz-Gerald; and Huning, Werner, 4,144,313, Cl. 423-210.000.
Borovkova, Nina K.: *See*—
Pyatnitskaya, Irina N.; Ivanov, Vladimir I.; Borovkova, Nina K.; and Naidenova, Nina G., 4,144,348, Cl. 424-274.000.
Borsig Gesellschaft mit beschrankter Haftung: *See*—
Lange, Bernd, 4,143,851, Cl. 251-29.000.
Bosch-Siemens Hausgerate GmbH: *See*—
Husslein, Julius; and Hertel, Wilhelm, 4,143,647, Cl. 126-390.000.
Bosch, Walter, to Bohner & Kohle GmbH & Co. Method of manufacturing solid wheel rims. 4,143,533, Cl. 72-68.000.
Bosshard, Ernst, to Sulzer Brothers Ltd. Apparatus for irradiating a flowable substance. 4,144,456, Cl. 250-437.000.
Bosso, Joseph F.; and Castellucci, Nicholas T., to PPG Industries, Inc. Electrodeposition of N-heterocyclic-containing resins. 4,144,159, Cl. 204-181.00C.
Bott, Daniel A. Crawfish trap. 4,143,480, Cl. 43-105.000.
Bottka, Nicholas, to United States of America, Navy. Tunable infrared detector with narrow bandwidth. 4,144,540, Cl. 357-30.000.
Bouknecht, Max A.; and Vergari, Louis P., to International Business Machines Corporation. Input/output interface connector circuit for repowering and isolation. 4,144,565, Cl. 364-200.000.
Boulton, Alan H., to Johnson & Johnson. Textile fabric and method of manufacturing the same. 4,144,370, Cl. 428-233.000.
Bouman, Willem J., to Automatic Sprinkler Limited. Pipe end shaper. 4,143,535, Cl. 72-119.000.
Bourgeois, Louis, to Solvay & Cie. Electrolytic diaphragm cell. 4,144,161, Cl. 204-229.000.
Boutros, Kamal S., to Bunker Ramo Corporation. Modular interconnect assembly for telecommunications systems. 4,143,932, Cl. 339-17.00F.
Boutros, Kamal S., to Bunker Ramo Corporation. Filter connector. 4,144,509, Cl. 333-181.000.
Bowes, Quentin; Haase, Jaroslav; and Wurster, Rudolf F., to Ciba-Geigy AG. Polysaccharide-containing adsorbent. 4,144,190, Cl. 252-427.000.
Boyd, Alfred K., to Texas Instruments Incorporated. Printhead needle cap. 4,143,979, Cl. 400-124.000.
Boyd, Edward G. C. A.: *See*—
Mutton, David E.; and Boyd, Edward G. C. A., 4,144,576, Cl. 364-564.000.
Boyd, Herman L. Thaw alarm for food freezer. 4,144,532, Cl. 340-585.000.
Boyesen, Eyvind, to Performance Industries, Inc. Injector porting for two cycle internal combustion engine. 4,143,626, Cl. 123-73.00A.
Brace, Neal O., to Ciba-Geigy Corporation. Perfluoroalkyl-iodo norbornane dicarboxylic acids and derivatives thereof. 4,144,244, Cl. 260-326.00C.
Bradshaw, Janice; Cook, Martin C.; and Gregory, Gordon I., to Glaxo Laboratories Limited. Cephalosporins having at position-7 a carboxy substituted α-etherified hydroxyimino-arylacetamido group and at position-3 the residue of a sulphur nucleophile. 4,144,392, Cl. 544-27.000.
Bradshaw, Janice; Cook, Martin C.; and Gregory, Gordon I., to Glaxo Laboratories Limited. 3-Acetoxymethyl cephalosporins having at position-7 a carboxy substituted α-etherified hydroxyiminoarylacetamido group. 4,144,393, Cl. 544-28.000.
Braese, Hans: *See*—
Casper, Rudolf; Nolte, Wilfried; and Braese, Hans, 4,144,286, Cl. 260-876.00R.
Brakebill, Harold G., to Robertshaw Controls Company. Pilot operated valve positioner. 4,143,850, Cl. 251-28.000.
Brand, Francis P. Safety match book. 4,143,761, Cl. 206-106.000.
Bratengeier, Horst: *See*—
Boje, Jurgen; Bratengeier, Horst; Zaveta, Karel; and Schumann, Gunter, 4,143,929, Cl. 339-5.00M.
Braun, Heinz; Kiesel, Karl; and Stotz, Wolf-Gunter, to Escher Wyss GmbH. Winder for a papermaking machine. 4,143,828, Cl. 242-65.000.

Breeden, Arnold H., to Rolles, Joseph P. Chemical etching of record patterns and the like. 4,144,300, Cl. 264-106.000.

Brekhov, Evgeny I.: *See—*
Malyshev, Boris N.; Saljuk, Viktor A.; Skobelkin, Oleg K.; Toschakov, Robert A.; Brekhov, Evgeny I.; Egorov, Evgeny I.; and Ivanov, Alexei I., 4,143,660, Cl. 128-303.100.

Breston, Michael P.: *See—*
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Bridgestone Tire Company Limited: *See—*
Utsunomiya, Tadashi; Ueda, Shigeo; Kamachi, Kiyotaka; and Wakamiya, Masatoshi, 4,143,454, Cl. 29-460.000.

Bright, Elvin M., Sr. Emitter for drip irrigation systems. 4,143,820, Cl. 239-108.000.

Britax (Wingard) Ltd.: *See—*
Cunningham, Douglas J.; and Tilley, Ronald F., 4,143,831, Cl. 242-107.40A.

British Industrial Plastics Limited: *See—*
Downing, Brian Y.; and Hamer, George D., 4,144,385, Cl. 521-95.000.

British Steel Corporation: *See—*
Jackson, George; and Wooddisse, John, 4,144,009, Cl. 425-79.000.

Britton, Thomas C.; and Trepanier, Donald L., to Dow Chemical Company, The. Method for preparing benzo-(1,3,4)-benzotriazepines. 4,144,233, Cl. 260-239.30B.

Brodene Gram A/S: *See—*
Gram, Hans, 4,143,758, Cl. 198-624.000.

Brody, Philip S., to United States of America, Army. Memory transistor. 4,144,591, Cl. 365-228.000.

Bronstert, Bernd; Lenz, Werner; Hartmann, Heinrich; Werther, Heinz-Ulrich; and Zuerger, Manfred, to BASF Aktiengesellschaft. Photopolymerizable composition for the manufacture of relief printing plates. 4,144,073, Cl. 96-115.00P.

Bronstert, Klaus: *See—*
Mittnacht, Hans; Echte, Adolf; Jenne, Helmut; Lieb, Manfred; Bronstert, Klaus; and Adler, Hansjoerg, 4,144,204, Cl. 260-4.0AR.

Brooks, Joseph F.; Hohulin, Samuel E.; and Lockhart, Scott N., to National Union Electric Corporation. Vacuum cleaner nozzle. 4,143,441, Cl. 15-369.000.

Brooks, Peter L., to Raychem Corporation. Stable heat shrinkable ternary β-brass alloys containing aluminum. 4,144,104, Cl. 148-11.50R.

Brown, Fred; and Vinezeano, Anthony D., to Andrew Corporation. Corrugated electrical waveguide with permanent twist. 4,144,510, Cl. 333-241.000.

Brown, Thomas R., Sr.: *See—*
Oshinsky, Frank W.; and Brown, Thomas R., Sr., 4,143,701, Cl. 164-368.000.

Browning, Walter P.; and Dodge, William L. Game with pivoting member and coordinated circuitous paths. 4,143,875, Cl. 273-101.000.

Brucken, Byron L., to General Motors Corporation. Rotary through vane compressor. 4,144,005, Cl. 418-255.000.

Bruder, Edward A.: *See—*
Coulombe, Lionel J.; and Bruder, Edward A., 4,143,608, Cl. 112-210.000.

Brummett, Houston H.; and Brummett, Norma J. Tamperproof security door lock. 4,143,529, Cl. 70-152.000.

Brummett, Norma J.: *See—*
Brummett, Houston H.; and Brummett, Norma J., 4,143,529, Cl. 70-152.000.

Brunn, Oswald. Adjustable-height article of furniture. 4,143,602, Cl. 108-117.000.

Brunswick Corporation: *See—*
Tuttle, Orvil, 4,143,501, Cl. 52-731.000.

Bryans, David F., to Carrier Corporation. Air conditioning control and method of operation. 4,143,813, Cl. 236-51.000.

BTS - Systemtwicklungs GmbH: *See—*
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Bucek, Miroslav: *See—*
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Bucher-Guyer AG, Maschinenfabrik: *See—*
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Buell Industries, Inc.: *See—*
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Bunda, Tsuchio: *See—*
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Bundy, Gordon L., to Upjohn Company, The. 9-Deoxy-9-methylene-PGF-type lactones. 4,144,253, Cl. 260-343.410.

Bundy, Gordon L., to Upjohn Company, The. 2-Decarboxy-2-alkylcarbonyl-3,7-inter-m-phenylene-3-oxa-4,5,6-trinor-11-deoxy-PGF$_1$ compounds. 4,144,273, Cl. 260-590.00C.

Bundy, Gordon L., to Upjohn Company, The. 2-Decarboxy-2-alkylcarbonyl-11-deoxy-PGE compounds. 4,144,274, Cl. 260-590.00C.

Bundy, Gordon L., to Upjohn Company, The. 3,7-Inter-phenylene-4,5,6-trinor-3-oxa-2-decarboxy-2-hydroxymethyl-9-deoxy-9-methylene-PGF-type compounds. 4,144,276, Cl. 568-645.000.

Bunker Ramo Corporation: *See—*
Boutros, Kamal S., 4,143,932, Cl. 339-17.00F.
Boutros, Kamal S., 4,144,509, Cl. 333-181.000.
DeRoss, Robert; and Kaczmarek, Leonard, 4,143,936, Cl. 339-276.00T.

Bunting, Alison R.; and Sharki, Martin J., to Dresser Industries, Inc. Reverse pressure activated rotary drill head seal. 4,143,880, Cl. 277-31.000.

Bunting, Alison R., to Dresser Industries, Inc. Lubricant cooled rotary drill head seal. 4,143,881, Cl. 277-31.000.

Burbidge, Colin, to Beecham Group Limited. Cell culture method. 4,144,126, Cl. 195-1.100.

Burdorf, Donald L.; Bjordahl, James; Kincel, Roger S.; and Arns, Harold E., to BASF Aktiengesellschaft. Transducer positioning device. 4,144,549, Cl. 360-78.000.

Burger, Manfred R.; Gagel, Ernst; Kalmovicz, Rudolf; and Prechtl, Alfred. Apparatus to transfer heat or refrigerant. 4,143,523, Cl. 62-324.000.

Burke, Timothy R.: *See—*
Ashcraft, Arnold C.; Turbett, Robert J.; and Burke, Timothy R., 4,144,202, Cl. 252-63.200.

Burkett, Albert L.; and Nelson, Albert O. Sewage treatment system. 4,144,167, Cl. 210-104.000.

Burroughs Corporation: *See—*
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Burroughs Wellcome Co.: *See—*
Stratford, Michael G.; and Lee, Ronald H. D. F., deceased, 4,143,794, Cl. 222-42.000.
Yeowell, David A.; and Swaringen, Roy A., Jr., 4,144,263, Cl. 260-465.00D.

Burry, Laurance W.: *See—*
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Burton, John D.; and Huggett, Richard D. J., to Lewmar Marine Limited. Winch. 4,143,855, Cl. 254-150.00R.

Busse, Wolfgang: *See—*
Klotzner, Winfried; Daumer, Rolf; Busse, Wolfgang; and du Mont, Hans-Christoph, 4,143,622, Cl. 123-32.0EC.

Butler-Automatic, Inc.: *See—*
Cogswell, John, 4,143,568, Cl. 83-116.000.

Butler, Walter J.; and Puckette, Charles M., to General Electric Company. Dual-slope analog to digital converter. 4,144,527, Cl. 340-347.0AD.

Buzio, Pierpaolo: *See—*
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Bybee, Halbert H., Jr.: *See—*
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Byrd, Charles F.: *See—*
Tice, William G., 4,144,364, Cl. 428-9.000.

Cale, Albert D., Jr., to A. H. Robins Company, Inc. 4-Hydroxymethyl-2-pyrrolidinones. 4,144,245, Cl. 260-326.5FL.

Calentine, John W.: *See—*
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Calkins, Thornton R., to General Electric Company. Process for preparing injection moldable thermosettable composition. 4,144,302, Cl. 264-130.000.

Camacho, Vasco G.: *See—*
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Cambridge Consultants Limited: *See—*
Temple, Stephen; and Paton, Anthony D., 4,143,685, Cl. 139-456.000.

Campbell, Willis R.: *See—*
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Canon Kabushiki Kaisha: *See—*
Ando, Yujiro; Ishihara, Shunichi; Murakawa, Shuji; and Ohara, Katsunobu, 4,143,965, Cl. 355-35.00C.
Seki, Mitsuaki; and Kishimoto, Jyuji, 4,144,580, Cl. 364-707.000.
Suzaki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takahashi, Kiyoshi; and Takimoto, Hiroyuki, 4,143,951, Cl. 352-169.000.

Capaul, Marcel: *See—*
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Carborundum Company, The: *See—*
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Carl Freudenberg, Firma: *See—*
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Schmidt, Klaus; Graber, Adolf; and Helbeck, Hans U., 4,144,553, Cl. 361-227.000.

Carl Schenck AG: *See—*
Mueller, Martin; and Schoenfeld, Harald, 4,144,578, Cl. 364-575.000.

Carlson, Larry N. Can crusher. 4,143,595, Cl. 100-280.000.

Carrier Corporation: *See—*
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Caruth, James R.: *See—*
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Casalino, Carlo: *See—*
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Casebier, John P. Refrigerator beverage dispensers. 4,143,795, Cl. 222-143.000.

Casper, Rudolf; Nolte, Wilfried; and Braese, Hans, to Bayer Aktiengesellschaft. Thermoplastic PVC resin compositions. 4,144,286, Cl. 260-876.00R.

Cassella Aktiengesellschaft: *See*—
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Bauer, Wolfgang; and Ribka, Joachim, 4,144,231, Cl. 260-157.000.
Castellucci, Nicholas T.: *See*—
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Caster, Terrence R.; and Burry, Laurance W., to Energy Systems, Inc. Method and apparatus for manufacturing solar heater panels. 4,143,448, Cl. 29-157.30C.
Castera, Jean-Paul: *See*—
Desormiere, Bernard; Hepner, Georges; and Castera, Jean-Paul, 4,143,939, Cl. 350-96.130.
Caterpillar Tractor Co.: *See*—
Gladden, Kenneth D., 4,143,863, Cl. 266-118.000.
Goloff, Alexander; Keske, Frank E.; Stafford, Darrell E.; and Stratton, Michael K., 4,143,629, Cl. 123-90.160.
Morello, Michael E.; and Cochran, Thomas E., 4,143,733, Cl. 180-69.00R.
Schell, Ralph C., 4,143,677, Cl. 137-875.000.
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Cetenko, Wiaczeslaw A.; and Morrison, Glenn C., to Warner-Lambert Company. N,N-dimethyl-1,2,4,5,6,7-hexahydrothiocino[5,4-b]-indole-7-propanamine-3,3-dioxides and related thiocines. 4,144,349, Cl. 424-274.000.
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Taylor, Robert E., 4,143,803, Cl. 229-27.000.
Chamberlin, Thomas A.; and Bangs, Sonia W., to Dow Chemical Company, The. Novel complexes of polyoxazolines or polyoxazines and halogens, interhalogens or pseudo-halogens and process for preparing same. 4,144,211, Cl. 260-29.20R.
Chambers, Robert R.; and Wohlmut, Peter G., to Atlantic Richfield Company. Luminescent solar collector. 4,144,097, Cl. 136-89.0PC.
Champion International Corporation: *See*—
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Chamuel, Jacques R., to Charles Stark Draper Laboratory, Inc., The. Position sensing readout. 4,144,519, Cl. 340-16.00R.
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Chan, John K., to Union Carbide Corporation. Process for preparing organothio-aldoxime compounds. 4,144,261, Cl. 260-453.0RW.
Chang, Nuke M.; and Renshaw, Robin, to Santa Fe International Corp. Automatic pipe welding apparatus. 4,144,439, Cl. 219-60.00A.
Chapman, Charles C.; and Hann, Paul D., to Phillips Petroleum Company. HF Alkylation process utilizing compressed isoparaffin vapor in indirect heat exchanges. 4,144,281, Cl. 260-683.480.
Chapman, Frank; and Holt, David, to Staflex International Limited. Method and apparatus for coating fusible interlinings. 4,144,538, Cl. 346-153.000.
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Chamuel, Jacques R., 4,144,519, Cl. 340-16.00R.
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Chatterji, Jiten, to Halliburton Company. Composition for treating low temperature subterranean well formations. 4,144,179, Cl. 252-8.55R.
Chen, Ho-Sou; and Polk, Donald E., to Allied Chemical Corporation. Amorphous metal alloys composed of iron, nickel, phosphorus, boron and, optionally carbon. 4,144,058, Cl. 75-170.000.
Chen, Richard Y., to Bausch & Lomb Incorporated. Process for putting a hydrophilic coating on a hydrophobic contact lens. 4,143,949, Cl. 351-160.00H.
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Wall, Robert G., 4,144,401, Cl. 568-840.000.
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Chicago and North Western Transportation Co.: *See*—
Ripple, Jack E., 4,143,769, Cl. 209-544.000.
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Chloride Incorporated: *See*—
Doherty, William F., 4,144,458, Cl. 250-574.000.
Malinowski, William J., 4,144,459, Cl. 250-574.000.
Chorlton, Derek C., to Conveyor Manufacturing Company Limited. Conveyor orientation unit. 4,143,756, Cl. 198-457.000.
Chorney, Peter L., to FMC Corporation. Corn cutter jam clearing system. 4,143,664, Cl. 130-9.00A.
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Ciba-Geigy Corporation: *See*—
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Eichenberger, Kurt; Kuhnis, Hans; Ostermayer, Franz; and Schroter, Herbert, 4,144,344, Cl. 424-267.000.
Eldin, Sameer H.; Seiz, Wolfgang; and Forster, Ewald, 4,144,120, Cl. 162-136.000.
Gsell, Laurenz; and Meyer, Willy, 4,144,330, Cl. 424-200.000.
Hartwig, Jost W., 4,144,014, Cl. 431-5.000.
Keller, Rudolf; and Topfl, Rosemarie, 4,144,026, Cl. 8-115.600.
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Clark, Clarence O.; DeAngelis, Robert L.; Deffren, Kenneth F.; Flautt, Thomas J.; Hofmann, Erwin A.; and Weinshenker, Eugene, to Procter & Gamble Company, The. Vessel for use in a microwave oven. 4,144,435, Cl. 219-10.55E.
Clark, Robert L.; Pessolano, Arsenio A.; and Shen, Tsung-Ying, to Merck & Co., Inc. Imidazo pyridine-2-ones and pharmaceutical compositions and methods of treatment utilizing same. 4,144,341, Cl. 424-256.000.
Clark, William H.; and Skinner, Charles E., to Dow Corning Corporation. Room temperature vulcanizable organic solvent dispersions of silicone elastomers. 4,144,216, Cl. 260-31.20R.
Clarke, Graham J., to Marconi Instruments Limited. Control devices. 4,144,481, Cl. 318-331.000.
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Cohen, Ellen R.: *See*—
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Cohen, I. Kelman. Saline fill of silicone prosthesis during mammaplasty augmentation. 4,143,428, Cl. 3-36.000.
Cohen, Louis, to B. F. Goodrich Company, The. Internally coated reaction vessel for use in olefinic polymerization. 4,144,307, Cl. 422-131.000.
Cohen, Ronald S.; and Dawley, James M., to Behavioral Controls, Inc. Portable therapeutic apparatus having patient responsive feedback means. 4,143,648, Cl. 128-1.00R.
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Heim, Edward L., 4,143,750, Cl. 194-97.00R.
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Coleman, Michael G.; Grenon, Lawrence A.; Pryor, Robert A.; and Restrepo, Fabio, to Motorola, Inc. Radiation responsive current generating cell and method of forming same. 4,144,094, Cl. 136-89.0CC.
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Columbia Chase Corporation: *See*—
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Colwell, Omar K., to Mid-Florida Mining Co. Masonry cement. 4,144,078, Cl. 106-97.000.
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CompAlarm Systems Co.: *See—*
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Compton, Elmer. Thermal engine. 4,143,517, Cl. 60-675.000.
Condor International Corporation: *See—*
Longo, Joseph F., 4,143,900, Cl. 294-70.000.
Conley, David H.; and Witmore, James D., to Emco Wheaton Inc. Flow control for vapor recovery nozzle. 4,143,689, Cl. 141-207.000.
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Cooper, Norman F.; and Lee, David N., to General Motors Corporation. Station wagon tailgate. 4,143,904, Cl. 296-57.00A.
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Coupland, Ralph. Load-sensing valves. 4,143,924, Cl. 303-22.00R.
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Crutchfield, Marvin M.; Papanu, Victor D.; and Warren, Craig B., to Monsanto Company. Polymeric acetal carboxylates. 4,144,226, Cl. 528-231.000.
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Cummings, William M., to Texaco Inc. Detergent fuel composition. 4,144,036, Cl. 44-71.000.
Cunningham, Douglas J.; and Tilley, Ronald F., to Britax (Wingard) Ltd. Safety belt retractors. 4,143,831, Cl. 242-107.40A.
Cunningham, Marion L.; Endicott, John R.; and Freeman, Lionel D., to Harris Corporation. Mobile communication system and method employing frequency reuse within a geographical service area. 4,144,496, Cl. 325-53.000.
Cunningham, Richard C., to Westinghouse Electric Corp. Tube support system. 4,143,709, Cl. 165-172.000.
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Davie, Neil R.; and Lambiotte, Joseph C., to International Business Machines Corporation. Feedback control for laser discharge system. 4,144,539, Cl. 346-160.000.
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Davis, Frank R., Jr. Personal dosimeter and method of use. 4,144,032, Cl. 23-232.00R.
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De Groef, Pierre; and Selleslags, Frank. Coaxial cable connector and method of making a coaxial cable connection. 4,144,404, Cl. 174-88.00C.

DeJovine, James M., to Atlantic Richfield Company. Compositions, apparatus and methods useful for releasing solid lubricating oil additive. 4,144,166, Cl. 210-60.000.

Deken, Frederick J. Adjustable drain plug. 4,143,432, Cl. 4-295.000.

Delbouille, Andre: *See*—
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Delen, Robert R. M.; and Lenaerts, Duido J. J., to U.S. Philips Corporation. Gas and/or vapor discharge lamp. 4,144,475, Cl. 315-73.000.

Del Rosso, Victor, to Hi-Speed Checkweigher Co., Inc. Multiple distribution conveyor system. 4,143,752, Cl. 198-365.000.

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Dementiev, Valentin V.; Zhidovich, Anatoly I.; Mosse, Alfred L.; Yasko, Oleg I.; Polak, Lev S.; Gulyaev, Genrikh V.; Levenzon, Rafail I.; Volodin, Nikolai L.; Vurzel, Filipp B.; and Laktjushin, Alexandr N. Method of heating gas and electric arc plasmochemical reactor realizing same. 4,144,444, Cl. 219-383.000.

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Dereppe, Michel; and Deryckere, Antoine, to Solvay & Cie. Process for the manufacture of sheets from a mixture of vegetable fibres and polyolefine. 4,144,304, Cl. 264-175.000.

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Desmond, Albert D. Auxiliary unit for driving a bicycle. 4,143,730, Cl. 180-33.00D.

Desormiere, Bernard; Hepner, Georges; and Castera, Jean-Paul, to Thomson-CSF. Magneto optical deflector. 4,143,939, Cl. 350-96.130.

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Destito, Joseph. Wall decorating device. 4,143,496, Cl. 52-173.00R.

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Klenk, Herbert; Lussling, Theodor; Maierhofer, Alfred; Offermanns, Heribert; and Wagner, Hans, 4,144,269, Cl. 260-545.00R.
Offermanns, Heribert; Klingler, Karl H.; Thiemer, Klaus; and Stroman, Fritz, 4,144,340, Cl. 424-253.000.

Deutsche Texaco Aktiengesellschaft: *See*—
Fuchs, Gundolf; Humbert, Heiko; and Pirck, Dietrich, 4,144,208, Cl. 260-27.00R.

de Vecchis, Michel: *See*—
Chiron, Bernard; and de Vecchis, Michel, 4,144,434, Cl. 219-10.55F.

Dever, Gerald V., Jr., to Olin Corporation. Generation of polyurethane foam. 4,144,295, Cl. 264-40.200.

DeVries, Robert C.; and Tuft, Roy E., to General Electric Company. Fingerprinting crystals. 4,143,544, Cl. 73-104.000.

Dewaele, Silvain A. R., to s.a. Texaco Belgium n.v. Preparation of ketone acetals. 4,144,249, Cl. 260-340.50R.

DeZabala, Edward F.: *See*—
Grimmell, William C.; Adams, Jim M.; Kaetzel, Gilbert C.; Fazzini, Robert P.; and DeZabala, Edward F., 4,143,770, Cl. 209-558.000.

Dickens, Luther I., to Mead Corporation, The. Process for molding a polystyrene foam structure with a bonded covering. 4,144,296, Cl. 264-45.400.

Dickson, Robert E.: *See*—
Cordon, Martin; and Dickson, Robert E., 4,144,322, Cl. 424-49.000.

Diesel Kiki Company, Ltd.: *See*—
Kobayashi, Masayoshi, 4,143,632, Cl. 123-139.0AQ.
Shibuya, Tsunenori; Ishizuka, Yutaka; and Nakamura, Teruo, 4,144,002, Cl. 418-76.000.

Dieterich, Dieter; and Markusch, Peter, to Bayer Aktiengesellschaft. Organic polyisocyanates. 4,144,267, Cl. 260-505.00R.

Dietlein, Robert W.; and Dietlein, William R. Ski rack, for vehicles. 4,143,799, Cl. 224-301.000.

Dietlein, William R.: *See*—
Dietlein, Robert W.; and Dietlein, William R., 4,143,799, Cl. 224-301.000.

Digital Equipment Corporation: *See*—
Lawson, Roger E.; and Richesson, Maurice A., 4,144,583, Cl. 364-900.000.

Dini, Roberto, to Indesit Industria Elettrodomestici. Television signal processing circuit for correcting amplitude distortions. 4,144,546, Cl. 358-174.000.

Di Ruocco, Camillo V.: *See*—
Lyshkow, Norman A.; Beningson, Herbert E.; and Di Ruocco, Camillo V., 4,144,019, Cl. 431-173.000.

Display Corporation International: *See*—
Rex, Roger F., 4,143,792, Cl. 221-97.000.

Diversified Plastics Products Inc.: *See*—
McCaffrey, James A., 4,143,800, Cl. 224-42.42R.

Divisi, Gualtiero, to Dropsa S.p.A. Single drive motor device particularly to supply fluid conveyance tandem line systems. 4,143,995, Cl. 417-3.000.

Dix, Michael D. Windowed T-top installation for vans and the like. 4,143,908, Cl. 296-137.00B.

Dixon, David R.: *See*—
Weiss, Donald E.; Dixon, David R.; and West, Simon M., 4,144,373, Cl. 428-306.000.

Dodge, William L.: *See*—
Browning, Walter P.; and Dodge, William L., 4,143,875, Cl. 273-101.000.

Doerges, Alexander; and Schlauer, Johannes, to Metallgesellschaft Aktiengesellschaft. Process for regenerating water-containing methanol. 4,144,314, Cl. 423-210.000.

Doherty, William F., to Chloride Incorporated. Smoke detector with test means for simulating a predetermined concentration of smoke. 4,144,458, Cl. 250-574.000.

Donaldson Company, Inc.: *See*—
Johnston, Gordon L., 4,144,043, Cl. 55-319.000.

Donohue, James M.; Ling, Andrew T.; Malinich, Richard M.; and Nelson, Frank M., to Xerox Corporation. Reproduction machine using fiber optics communication system. 4,144,550, Cl. 364-107.000.

D'Orazio, Vincent T., to S. C. Johnson & Son, Inc. Mosquito coil composition and process for making the same. 4,144,318, Cl. 424-40.000.

Doric Products, Inc.: *See*—
Abbate, Pio J., 4,143,494, Cl. 52-139.000.

Dorlars, Alfons; and Schellhammer, Carl-Wolfgang, to Bayer Aktiengesellschaft. 3-Pyrozolyl-4-triazolyl compounds. 4,144,243, Cl. 260-308.00A.

Dorn, Conrad P.: *See*—
Jones, Howard; and Dorn, Conrad P., 4,144,271, Cl. 260-564.00R.
Shen, Tsung-Ying; Jones, Howard; and Dorn, Conrad P., 4,144,342, Cl. 424-263.000.

Dorn, Gordon L.; and Land, Geoffrey A., to J. K. and Susie L. Wadley Research Institute and Blood Bank. Fungal growth media. 4,144,133, Cl. 195-100.000.

Dotzer, Richard; Hauschildt, Hans-George; and Todt, Enno, deceased (by Todt, Susanne, Ruth K. Todt, Ernst J. Todt, heirs), to Siemens Aktiengesellschaft. Method for the preparation of additives in organo-aluminum electrolyte media. 4,144,140, Cl. 204-14.00N.

Dotzer, Richard: *See*—
Birkle, Siegfried; Dotzer, Richard; and Rissel, Eva, 4,144,360, Cl. 427-123.000.

Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel B.V.: *See*—
Thijssen, Henricus A. C., 4,143,524, Cl. 62-542.000.

Dow Chemical Company, The: *See*—
Britton, Thomas C.; and Trepanier, Donald L., 4,144,233, Cl. 260-239.30B.
Chamberlin, Thomas A.; and Bangs, Sonia W., 4,144,211, Cl. 260-29.20R.
Dowd, William; and Fisher, Thomas H., 4,144,265, Cl. 260-465.00G.
Hartwell, George E.; and Garrou, Philip E., 4,144,191, Cl. 252-428.000.
Pavlich, Joseph P., 4,143,715, Cl. 166-271.000.
Watanabe, Takeshi; and Kodama, Kenichiro, 4,144,289, Cl. 260-897.00C.

Dow Corning Corporation: *See*—
Clark, William H.; and Skinner, Charles E., 4,144,216, Cl. 260-31.20R.

Dowd, William; and Fisher, Thomas H., to Dow Chemical Company, The. Process for the manufacture of m-trifluoromethyl benzyl nitrile. 4,144,265, Cl. 260-465.00G.

Down, Dennis L. R. Rope or cable clamp device. 4,143,446, Cl. 24-115.00R.

Downing, Brian Y.; and Hamer, George D., to British Industrial Plastics Limited. Intumescent coating materials. 4,144,385, Cl. 521-95.000.
Drabert, Fritz: *See—*
Geffers, Klaus; and Drabert, Fritz, 4,143,910, Cl. 297-301.000.
Dragone, Corrado, to Bell Telephone Laboratories, Incorporated. Method and apparatus for substantially reducing cross polarized radiation in offset reflector antennas. 4,144,535, Cl. 343-756.000.
Dravo Corporation: *See—*
Karnofsky, George B., 4,144,229, Cl. 260-123.500.
Drelich, Arthur H.; and Lukacs, George J., to Johnson & Johnson. Resin latex compositions. 4,144,209, Cl. 260-29.20M.
Dresser Industries, Inc.: *See—*
Bunting, Alison R.; and Sharki, Martin J., 4,143,880, Cl. 277-31.000.
Bunting, Alison R., 4,143,881, Cl. 277-31.000.
Graham, Richard B.; and Mercurio, Richard N., 4,144,174, Cl. 210-527.000.
Driver, W. B. Downhole flexible drive system. 4,143,722, Cl. 175-95.000.
Drobnik, Leszek R., to Acme-Cleveland Corporation. Angled molding machine. 4,143,700, Cl. 164-187.000.
Drobnik, Stefan; Hild, Werner; Kaufmann, Friedrich; and Koschorke, Herbert, to Gesellschaft fur Kernforschung m.b.H. Method and apparatus for processing aqueous radioactive wastes for noncontaminating and safe handling, transporting and final storage. 4,144,186, Cl. 422-159.000.
Droguet International: *See—*
Bona, Edmond, 4,143,772, Cl. 211-59.100.
Dropsa S.p.A.: *See—*
Divisi, Gualtiero, 4,143,995, Cl. 417-3.000.
Dry Dock Industries, Inc.: *See—*
Smith, Jon D.; and Parker, Glenn T., 4,143,581, Cl. 85-80.000.
Dual-Lite, Inc.: *See—*
Sieron, Richard L.; Kozek, Edward P.; and Shine, William P., 4,144,462, Cl. 307-66.000.
Duckett, John C.: *See—*
Meadows, Roger D.; and Duckett, John C., 4,143,559, Cl. 74-231.00R.
Dudko, Daniil A.: *See—*
Mozzhukhin, Anatoly A.; Dudko, Daniil A.; Sotchenko, Vladimir P.; and Maximovich, Boleslav I., 4,144,432, Cl. 219-9.500.
du Mont, Hans-Christoph: *See—*
Klotzner, Winfried; Daumer, Rolf; Busse, Wolfgang; and du Mont, Hans-Christoph, 4,143,622, Cl. 123-32.0EC.
Dunicz, Boleslaw L. Spill free fluid transfer funnel. 4,143,690, Cl. 141-333.000.
Dunkers, Karl R. Apparatus for water treatment. 4,144,170, Cl. 210-221.00P.
Dunn, Mervin E. Controlled sun-lit plant house. 4,143,492, Cl. 52-18.000.
Du Pont de Nemours, E. I., and Company: *See—*
Haack, David J.; and Reeves, James W., 4,144,316, Cl. 423-502.000.
Jarrett, Howard S.; Kung, Harold H. C.; and Sleight, Arthur W., 4,144,147, Cl. 204-129.000.
Provost, Richard L., 4,144,023, Cl. 8-17.000.
Durekovic, Andija: *See—*
Kula, Maria-Regina; Kroner, Karl-Heinz; Stach, Wolfgang; Hustedt, Helmut; Durekovic, Andija; and Grandja, Stefica, 4,144,130, Cl. 195-66.00R.
Durkee, Lawrence F., to Solarex Corporation. Method of plating by means of light. 4,144,139, Cl. 204-15.000.
Durst AG Fabrik Fototechnischer Apparate: *See—*
Gandini, Mario, 4,143,966, Cl. 355-35.000.
Dutkewych, Oleh B.; Gaputis, Charles A.; Gulla, Michael; and Levy, Leonard R. Etchant and process. 4,144,119, Cl. 156-659.000.
Duval, Ernest H.; and Thompson, Harold R., to Gillette Company, The. Roller-type cosmetic applicator. 4,143,668, Cl. 132-88.500.
Dynamit Nobel Aktiengesellschaft: *See—*
Beckmann, Rolf; and Knackstedt, Wilhelm, 4,144,376, Cl. 428-429.000.
Hoppe, Walter; Junger, Hans; and Weissenfels, Franz, 4,143,867, Cl. 266-272.000.
Dynapol: *See—*
Wang, Patricia C.; and Wingard, Robert E., 4,144,252, Cl. 260-371.000.
E-Systems, Inc.: *See—*
Webber, William F., 4,144,571, Cl. 364-450.000.
Eastman Kodak Company: *See—*
Figueras, John, 4,144,306, Cl. 422-56.000.
Kurtz, Clark N., 4,143,962, Cl. 355-10.000.
Lelental, Mark; and Gysling, Henry J., 4,144,062, Cl. 96-114.100.
Schmidt, Robert R., III; and Holmes, Jerry D., 4,143,858, Cl. 526-48.200.
Easton, Harlan J. Animal production cycle programmer. 4,143,928, Cl. 312-197.000.
Eaton Corp.: *See—*
Holton, Robert J.; and Waterson, James F., 4,143,696, Cl. 151-41.750.
Eaton, Favre E., to Combustion Engineering, Inc. Long life incandescent switching system. 4,144,477, Cl. 315-276.000.
Ebauches Bettlach S.A.: *See—*
Bachmann, Peter, 4,143,511, Cl. 58-140.00A.
Eberhardt, Robert M., to All States Plastic Manufacturing Co., Inc. Anchor base fastener. 4,143,577, Cl. 85-5.00R.
Echte, Adolf: *See—*
Mittnacht, Hans; Echte, Adolf; Jenne, Helmut; Lieb, Manfred; Bronstert, Klaus; and Adler, Hansjoerg, 4,144,204, Cl. 260-4.0AR.
Edgar, Allen C.; and Smith, George N., to Mid-Florida Mining Co. Method for the containment of oils and oil sludges. 4,144,162, Cl. 208-13.000.
Edmonds, Harold D.; and Markovits, Gary, to International Business Machines Corporation. High performance silicon wafer and fabrication process. 4,144,099, Cl. 148-1.500.
Edward Rose (Birmingham) Limited: *See—*
Ireland, Alfred L., 4,143,907, Cl. 296-137.00C.
Edwards, Laroy H., to Chevron Research Company. Insecticidal 2-substituted-imino-3-alkyl-5-dialkoxyphosphinothioyloxy-6H-1,3,4-thiadiazine. 4,144,335, Cl. 424-246.000.
Edwards, Ray B. Intermeshing gear rotary engine with valved inlet. 4,144,004, Cl. 418-185.000.
Edwin Cooper and Company Limited: *See—*
Jayne, Gerald J. J.; and Askew, Herbert F., 4,144,247, Cl. 260-329.00P.
EFB Inc.: *See—*
Zahedi, Karim; Alexander, Jeffery; and Zieve, Peter, 4,144,359, Cl. 427-39.000.
Eggers, Edward T.: *See—*
Sheesley, Donald L.; Eggers, Edward T.; and Campbell, Willis R., 4,143,505, Cl. 56-341.000.
Egorenkova, Alla N.: *See—*
Vainshtein, Viktor A.; Kulbakh, Valter O.; Etingov, Evgeny D.; Naumchik, Grigory N.; Ekzemplyarov, Oleg N.; Mikhailets, Georgy A.; Grinberg, Grigory E.; and Egorenkova, Alla N., 4,144,328, Cl. 424-180.000.
Egorov, Evgeny I.: *See—*
Malyshev, Boris N.; Saljuk, Viktor A.; Skobelkin, Oleg K.; Toschakov, Robert A.; Brekhov, Evgeny I.; Egorov, Evgeny I.; and Ivanov, Alexei I., 4,143,660, Cl. 128-303.100.
Eguchi, Toru: *See—*
Tadakuma, Yuji; Saito, Syunji; and Eguchi, Toru, 4,144,567, Cl. 364-405.000.
Ehlers, Bruce W., to Litton Systems, Inc. Microwave oven energy stirrer. 4,144,437, Cl. 219-10.55F.
Ehrens, Henry; Slocum, Charles W.; Mancuso, Anthony; and Weiner, Sidney, to Sealed Unit Parts Co., Inc. Aligning kit. 4,143,843, Cl. 248-544.000.
Eichenberger, Kurt; Kuhnis, Hans; Ostermayer, Franz; and Schroter, Herbert, to Ciba-Geigy Corporation. Antihypertensive 1-substituted-4-(2-oxo-1-imidazolidinyl) piperidines. 4,144,344, Cl. 424-267.000.
Eiloo, Gary A.: *See—*
Kaye, Robert M.; Eiloo, Gary A.; and Tucker, Thomas, 4,144,486, Cl. 324-3.000.
Eisenberg, Arnold J.: *See—*
Pierce, Richard H.; and Eisenberg, Arnold J., 4,143,506, Cl. 57-22.000.
Eistert, Theodor: *See—*
Noack, Christian; Oliva, Klaus; Eistert, Theodor; Zumpf, Bernd; Spaida, Hans P.; John, Gunter; Pietschmann, Frank; Boltizar, Pal; Fabry, Istvan; Vida, Csongor; Lakos, Lajos; and Klement, Matyas, 4,143,504, Cl. 56-98.000.
Ekzemplyarov, Oleg N.: *See—*
Vainshtein, Viktor A.; Kulbakh, Valter O.; Etingov, Evgeny D.; Naumchik, Grigory N.; Ekzemplyarov, Oleg N.; Mikhailets, Georgy A.; Grinberg, Grigory E.; and Egorenkova, Alla N., 4,144,328, Cl. 424-180.000.
Eldin, Sameer H.; Seiz, Wolfgang; and Forster, Ewald, to Ciba-Geigy Corporation. Method for treating paper with a composition containing hydantoin compounds and a copolymer. 4,144,120, Cl. 162-136.000.
Eldred, Paul J., to Morgan Fairest Limited. Labelling machines with article guide plate. 4,143,754, Cl. 198-379.000.
Electric Power Research Institute, Inc.: *See—*
Schaefer, Donald L.; and Temple, Victor A. K., 4,144,541, Cl. 357-30.000.
Elek, Sandor: *See—*
Bognar, Reszo; Makleit, Sandor; Kiss, Geza; Berenyi, Sandor; Mile, Terez; Knoll, Jozsef; Elek, Sandor; Gyoker, Istvan; Zoltai, Attila; Toth, Gyorgy; and Litkei, Laszlo, 4,144,236, Cl. 546-46.000.
Elenbaas, George H. Means of securing mecury displacement switches to a mounting bracket. 4,144,431, Cl. 200-295.000.
Elger, Walter: *See—*
Petzoldt, Karl; and Elger, Walter, 4,144,334, Cl. 424-243.000.
Eli Lilly and Company: *See—*
Hatfield, Lowell D., 4,144,391, Cl. 544-21.000.
Koppel, Gary A.; and Cooper, Robin D. G., 4,144,232, Cl. 260-239.00A.
Elliott, Robert J.; and Gardiner, John B., to Exxon Research & Engineering Co. Polymeric additives for fuels and lubricants. 4,144,181, Cl. 252-33.000.
Emanuelsson, Jan G.; and Wahlen, Svante L., to Berol Kemi AB. Quaternary ammonium compounds and treatment of cellulose pulp and paper therewith. 4,144,122, Cl. 162-158.000.
Emco Wheaton Inc.: *See—*
Conley, David H.; and Witmore, James D., 4,143,689, Cl. 141-207.000.
Emerson Electric Co.: *See—*
Thweatt, Carlisle, Jr., 4,144,445, Cl. 219-532.000.

Emhart Industries, Inc.: *See—*
Bergen, Gary R., 4,143,897, Cl. 292-347.000.
Enders, George E., to NRM Corporation. Tire building machine. 4,144,114, Cl. 156-414.000.
Endicott, John R.: *See—*
Cunningham, Marion L.; Endicott, John R.; and Freeman, Lionel D., 4,144,496, Cl. 325-53.000.
Energietechnik GmbH: *See—*
Meysenburg, Helmut, 4,143,815, Cl. 237-2.00B.
Energy Development Associates: *See—*
Fatica, Nicholas, 4,144,381, Cl. 429-50.000.
Energy Systems, Inc.: *See—*
Caster, Terrence R.; and Burry, Laurance W., 4,143,448, Cl. 29-157.30C.
Engineered Yarns, Inc.: *See—*
Okie, James P.; and Worrall, James D., 4,144,371, Cl. 428-255.000.
Enokizono, Shigehiro; and Ushiro, Soichiro, to CPC International Inc. Process for immobilizing glucose isomerase. 4,144,127, Cl. 195-63.000.
Epworth, Richard E.: *See—*
Leggett, Norman D.; and Epworth, Richard E., 4,144,504, Cl. 331-94.50P.
Erich, Otis G., Jr., to Union Oil Company of California. Rotating eccentric weight seismic sources and a seismic exploration method. 4,143,737, Cl. 181-121.000.
Erickson, Kenneth W., to Square D Company. Circuit breaker bolt-on flexible connector. 4,144,554, Cl. 361-355.000.
Eriksson, Bengt S.: *See—*
Petersson, Stig A.; and Eriksson, Bengt S., 4,144,055, Cl. 75-73.000.
Ernsberger, Fred M., to PPG Industries, Inc. Electron bombardment method for making stained glass photomasks. 4,144,066, Cl. 96-35.100.
Ernsthausen, Roger E., to Owens-Illinois, Inc. Gas discharge device containing coated dielectric. 4,144,375, Cl. 428-336.000.
Erspamer, James R.; Jackson, John R.; Misch, Roger A.; and Waldrop, John L., to Sperry Rand Corporation. Semi-automatic self-contained magnetic azimuth detector calibration apparatus and method. 4,143,467, Cl. 33-356.000.
Escher Wyss GmbH: *See—*
Braun, Heinz; Kiesel, Karl; and Stotz, Wolf-Gunter, 4,143,828, Cl. 242-65.000.
Esposito, James E. Method of stimulating the flow of latex and compositions used therein. 4,144,046, Cl. 71-86.000.
Esquire, Inc.: *See—*
Nuver, Eric L. H., 4,144,478, Cl. 315-291.000.
Etablissements Francois Salomon et Fils: *See—*
Salomon, Georges P. J., 4,143,886, Cl. 280-624.000.
Etingov, Evgeny D.: *See—*
Vainshtein, Viktor A.; Kulbakh, Valter O.; Etingov, Evgeny D.; Naumchik, Grigory N.; Ekzemplyarov, Oleg N.; Mikhailets, Georgy A.; Grinberg, Grigory E.; and Egorenkova, Alla N., 4,144,328, Cl. 424-180.000.
Everman, Wayne F.; and Bernard, Vincent E., to Swift & Company. Apparatus for assembling items. 4,143,773, Cl. 414-787.000.
Exler, Petrus A. T. Container comprising an improved floor structure. 4,143,588, Cl. 98-6.000.
Exxon Research & Engineering Co.: *See—*
Elliott, Robert J.; and Gardiner, John B., 4,144,181, Cl. 252-33.000.
Jacobson, Allan J.; Chianelli, Russell R.; and Whittingham, M. Stanley, 4,144,384, Cl. 429-218.000.
Kamholz, Kenneth, 4,143,469, Cl. 34-1.000.
Patton, Tad L., 4,144,213, Cl. 260-30.200.
Fa. Pass & Co.: *See—*
Hintz, Ulrich, 4,143,495, Cl. 52-145.000.
Fabry, Istvan: *See—*
Noack, Christian; Oliva, Klaus; Eistert, Theodor; Zumpf, Bernd; Spaida, Hans P.; John, Gunter; Pietschmann, Frank; Boltizar, Pal; Fabry, Istvan; Vida, Csongor; Lakos, Lajos; and Klement, Matyas, 4,143,504, Cl. 56-98.000.
Fael SA: *See—*
Schalch, Fred E.; and Szoky, Anton, 4,144,440, Cl. 219-61.500.
Fahey, Darryl R.; and Mahan, John E., to Phillips Petroleum Company. Organophosphorus nickel complexes and use thereof. 4,144,259, Cl. 260-439.00R.
Fahrbach, Erich: *See—*
Knoke, Jurgen; Stegmann, Gerhard; Tecl, Bohuslav; and Fahrbach, Erich, 4,143,424, Cl. 2-255.000.
Fair, Delbert W., to Continental Oil Company. Seismic transducer construction. 4,143,736, Cl. 181-119.000.
Falcq, Rene G., to Societe Anonyme Metal Deploye Belge. Device for binding bundles of elongate angle-section members and manufacturing apparatus incorporating such devices. 4,143,594, Cl. 100-7.000.
Farha, Floyd E., Jr.: *See—*
Walker, Darrell W.; and Farha, Floyd E., Jr., 4,144,277, Cl. 260-666.00A.
Farina, Attilio; and Zappala, Giuseppe, to Indesit Industria Elettrodomestici Italiana S.p.A. Circuit for providing saw-tooth current in a coil. 4,144,479, Cl. 315-408.000.
Faris, Sadeg M., to International Business Machines Corporation. Self-resetting Josephson device circuit. 4,144,465, Cl. 307-277.000.
Fass, Carl: *See—*
Klaus, Helmuth; Fass, Carl; and Lause, Heinz, 4,143,898, Cl. 293-137.000.
Fatica, Nicholas, to Energy Development Associates. Electrochemical pH control. 4,144,381, Cl. 429-50.000.
Faulkner, John P., to Burroughs Corporation. Apparatus for electro deposition of magnetically anisotropic metallic recording films. 4,144,160, Cl. 204-212.000.
Fazzini, Robert P.: *See—*
Grimmell, William C.; Adams, Jim M.; Kaetzel, Gilbert C.; Fazzini, Robert P.; and DeZabala, Edward F., 4,143,770, Cl. 209-558.000.
Fedders Corporation: *See—*
La Porte, Gerald E.; Osterkorn, Charles L.; and Marino, Salvatore M., 4,143,710, Cl. 165-182.000.
Feecon Corporation: *See—*
Gagliardo, John P.; and Purvis, Fay A., 4,143,717, Cl. 169-15.000.
Feinbloom, Richard E., to Designs for Vision, Inc. Microscope apparatus with television and film cameras. 4,143,938, Cl. 350-19.000.
Feldstein, Nathan. Methods for applying metallic silver coatings. 4,144,361, Cl. 427-162.000.
Felton, John C.; and Badmin, John S., to Shell Oil Company. Synergistic chlorfenvinphos and pyrethroid pesticidal composition. 4,144,331, Cl. 424-219.000.
Fenner, Werner, to Bucher-Guyer AG, Maschinenfabrik. Method of and apparatus for injection molding of injection molded parts containing imbedded inserts. 4,144,010, Cl. 425-125.000.
Ferdus, Stanislav: *See—*
Jansa, Milos; Spisiak, Juraj; and Ferdus, Stanislav, 4,143,682, Cl. 139-435.000.
Ferguson, Peter D.: *See—*
Lewis, Carl M.; and Ferguson, Peter D., 4,143,707, Cl. 165-28.000.
Fernandez, Albert. Ladder extension apparatus. 4,143,742, Cl. 182-201.000.
Fernandez, Mario F.: *See—*
Nichols, Joseph C.; Berner, John M.; and Fernandez, Mario F., 4,143,576, Cl. 84-318.000.
Fernsler, Ronald E., to RCA Corporation. Television horizontal oscillator frequency control arrangement for use with tape recorder. 4,144,544, Cl. 358-158.000.
Fernsler, Ronald E.; and Henley, Michael L., to RCA Corporation. Television horizontal oscillator frequency control arrangement for use with a tape recorder. 4,144,545, Cl. 358-158.000.
Ferrell, James E. Combined trim ring and support for headlights. 4,144,558, Cl. 362-255.000.
Ferrell, Joseph C., to Sun Coast Plastic Closures, Inc. Plastic vacuum sealing cap. 4,143,785, Cl. 215-270.000.
Fiber-Dyne, Inc.: *See—*
Olson, Rodney I.; and Szegedi, Nicholas J., 4,143,670, Cl. 137-72.000.
Olson, Rodney I., 4,143,671, Cl. 137-72.000.
Fiege, Helmut; Haydn, Josef; Renner, Johann; and Wedemeyer, Karlfried, to Bayer Aktiengesellschaft. Process for the continuous preparation of di-tertiary butylcresols. 4,144,400, Cl. 568-788.000.
Figueras, John, to Eastman Kodak Company. Element for analysis of liquids. 4,144,306, Cl. 422-56.000.
Fikentscher, Rolf: *See—*
Scharf, Emil; Fikentscher, Rolf; Auhorn, Werner; and Streit, Werner, 4,144,123, Cl. 162-164.00R.
Filer and Stowell Company, The: *See—*
Shields, Dean W., 4,143,775, Cl. 414-330.000.
Firestone Tire & Rubber Company, The: *See—*
Rumpf, Robert J., 4,143,913, Cl. 297-379.000.
Firmenich SA: *See—*
Sundt, Erling; and Aschiero, Roland, 4,144,200, Cl. 252-522.000.
Fischer, Adolf, deceased (by Fischer, Caecilia Emma, heiress-at-law), to BASF Aktiengesellschaft. Herbicidal compositions. 4,144,048, Cl. 71-92.000.
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Fischer, Warren G. Compact X-ray film processor. 4,143,959, Cl. 354-316.000.
Fisher, Marlene J. Brassiere. 4,143,662, Cl. 128-477.000.
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Fitzgerald-Smith, James P.; and Knight, Derek I., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Bridge reinforcements. 4,143,439, Cl. 14-10.000.
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Clark, Clarence O.; DeAngelis, Robert L.; Deffren, Kenneth F.; Flautt, Thomas J.; Hofmann, Erwin A.; and Weinshenker, Eugene, 4,144,435, Cl. 219-10.55E.
Fleischer, Henry. Clamping device. 4,143,893, Cl. 285-243.000.
Fleming, David L., to Sperry Rand Corporation. Magneto-optic bubble domain histograph incorporating gray scale weighting. 4,144,524, Cl. 340-754.000.
Fleming, Ian D.; Noble, David; Noble nee Gillett, Hazel M.; and Wall, Wilfred F., to Glaxo Laboratories Limited. Process for the purification of clavulanic acid. 4,144,242, Cl. 260-307.0FA.
Flickinger, Charles E.; and Schuchmann, Russell P., to Cutler-Hammer, Inc. Multiplex communication system. 4,144,410, Cl. 179-15.0AL.
Flournoy, Kenoth H.: *See—*
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Floyd, Alfred E., to Walter Kidde & Company, Inc. Disposable core for lock cylinder. 4,143,531, Cl. 70-367.000.
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Chorney, Peter L., 4,143,664, Cl. 130-9.00A.
Knight, Houston W., 4,143,675, Cl. 137-615.000.
Lill, Melvin H., 4,143,970, Cl. 356-155.000.

Radimer, Kenneth J.; and McCarthy, Michael J., 4,144,144, Cl. 204-82.000.
Templin, Harry W., 4,143,512, Cl. 59-85.000.
Fohl, Artur, to Repa Feinstanzwerk GmbH. Limit switch, particularly for the use as lock-switch for safety belts. 4,144,423, Cl. 200-61.58B.
Foidl, Helmut: *See*—
Kirchweger, Karl; Foidl, Helmut; List, Hans; and Greier, Josef, 4,143,895, Cl. 292-223.000.
Ford Motor Company: *See*—
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Melhorn, Barry J., 4,143,561, Cl. 74-730.000.
Winterbottom, Walter L., 4,143,802, Cl. 228-217.000.
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Eldin, Sameer H.; Seiz, Wolfgang; and Forster, Ewald, 4,144,120, Cl. 162-136.000.
Fortune, Jeffrey L. Thermosensitive safety valve. 4,143,812, Cl. 236-48.00R.
Fossum, Bryce G.; Markson, Kenneth J.; Schloss, Phillip C.; and Wing, James W., to International Business Machines Corporation. Interval timer. 4,144,447, Cl. 235-92.0PE.
Foster, Lloyd L.; Gaarder, Gary D.; and Venzke, Charles E., to A-T-O Inc. Circular sortation apparatus and methods. 4,143,751, Cl. 198-365.000.
Foti, George. Pump for closed circulation system. 4,143,649, Cl. 128-2.00N.
Fougman, Arthur, to Siemens Aktiengesellschaft. Fixation device. 4,143,445, Cl. 24-68.00R.
Frahm, Carl E.; and Frahm, Shirley E. Water bottle and its storage case. 4,143,784, Cl. 215-12.00R.
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Frahm, Carl E.; and Frahm, Shirley E., 4,143,784, Cl. 215-12.00R.
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Frankiewicz, Theodore C.; and Lueders, Robert E., to Kennecott Copper Corporation. High slurry density sulfidic mineral leaching using nitrogen dioxide. 4,144,310, Cl. 423-27.000.
Franz, Helmut, to PPG Industries, Inc. Non-oxidative removal of gold films. 4,144,090, Cl. 134-3.000.
Franz, John E.; and Howe, Robert K., to Monsanto Company. 3-Aryl-4-isoxazolecarboxylic acids as plant growth regulants. 4,144,047, Cl. 71-90.000.
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Cunningham, Marion L.; Endicott, John R.; and Freeman, Lionel D., 4,144,496, Cl. 325-53.000.
French, James E., to Hercules Incorporated. Thermosetting compositions containing a poly (arylacetylene) and a poly (phenylene oxide). 4,144,218, Cl. 260-32.60R.
Frenette, Eugene J. Friction heat space heater. 4,143,639, Cl. 126-247.000.
Frenkiel, Richard H., to Bell Telephone Laboratories, Incorporated. Cellular radiotelephone system structured for flexible use of different cell sizes. 4,144,411, Cl. 179-2.0EB.
Frensch, Heinz; Albrecht, Konrad; and Hook, Klaus, to Hoechst Aktiengesellschaft. Micro granules for pesticides and process for their manufacture. 4,144,050, Cl. 71-120.000.
Fribosa Ltd.: *See*—
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Fuchs, Gundolf; Humbert, Heiko; and Pirck, Dietrich, to Deutsche Texaco Aktiengesellschaft. Cold cross-linking dispersion adhesive. 4,144,208, Cl. 260-27.00R.
Fuji Photo Film Co., Ltd.: *See*—
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Ishibashi, Hiroshi; Sakai, Nobuo; Imai, Kiyoshi; and Nakajima, Junya, 4,144,068, Cl. 96-60.00R.
Shiba, Keisuke; Aono, Toshiaki; Hirose, Takeshi; and Shishido, Tadao, 4,144,071, Cl. 96-74.000.
Yoneyama, Masakazu; Inoue, Noriyuki; Tsuji, Nobuo; and Kameoka, Kimitaka, 4,144,069, Cl. 96-63.000.
Fuji Photo Optical Co., Ltd.: *See*—
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Fujii, Toshihiko, to Nissan Motor Company, Limited. Apparatus for deforming corrugated fiberboard. 4,143,587, Cl. 93-1.00D.
Fujimori, Noboru: *See*—
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Fujimoto, Hirohisa; Suzuki, Norihiko; Shibazaki, Kenji; and Arai, Kenichi, to Minolta Camera Kabushiki Kaisha. Feeding and cutting control mechanism for roll stored paper. 4,143,570, Cl. 83-205.000.
Fujiyoshi, Kazuhiko: *See*—
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Fukuda, Tsuguo; and Hirano, Hitoshi, to Tokyo Shibaura Electric Co., Ltd. Method for producing a lithium tantalate single crystal. 4,144,117, Cl. 156-617.0SP.
Funk, Buddy K.; and Smith, Clark L., to Sperry Rand Corporation. Position detection apparatus. 4,144,449, Cl. 250-221.000.
Furukawa Electric Co., Ltd., The: *See*—
Hara, Ryoichi; Yajima, Masamichi; Akai, Chiaki; and Matsumoto, Takuzo, 4,143,833, Cl. 242-158.00R.
Hara, Ryoichi; Yajima, Masamichi; Akai, Chiaki; and Matsumoto, Takuzo, 4,143,834, Cl. 242-158.00R.
Furukawa, Ken; and Nunotani, Sadao, to Kabushiki Kaisha Komatsu Seisakusho. Multi-vibro pile hammer. 4,143,719, Cl. 173-1.000.
Furukawa, Shoji: *See*—
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Fusco, Ronald S., to Amax Inc. Furnace rollers. 4,144,022, Cl. 432-246.000.
Futamura, Kazumasa: *See*—
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Gagliardo, John P.; and Purvis, Fay A., to Feecon Corporation. Nozzle. 4,143,717, Cl. 169-15.000.
Gaiffi, Sevi; Menth, Anton; and Nagel, Harmut, to BBC Brown, Boveri & Company, Limited. Method of making cerium misch-metal/cobalt magnets. 4,144,105, Cl. 148-103.000.
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Gallant, Gerald G., Jr.: *See*—
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Gallus, Julius P., to Union Oil Company of California. High temperature cement system. 4,144,077, Cl. 106-97.000.
Gamo, Takaharu; Moriwaki, Yoshio; Yamashita, Toshio; and Fukuda, Masataro, to Matsushita Electric Industrial Co., Ltd. Method of making a hydrogen storage alloy and product. 4,144,103, Cl. 148-3.000.
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Gandini, Mario, to Durst AG Fabrik Fototechnischer Apparate. Illumination device for photographic color apparatus. 4,143,966, Cl. 355-35.000.
Ganter, Wolfgang; and Ginter, Albert, to Gebruder Junghans GmbH, Firma. Battery operated electronic watch. 4,143,507, Cl. 58-4.00A.
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Gaubert, Rene J. Method and apparatus for separating bulk elongated products into quantities of predetermined weight. 4,143,725, Cl. 177-123.000.
Gaughan, Edmund J., to Stauffer Chemical Company. Herbicidal active carboxanilide derivatives. 4,144,250, Cl. 260-340.50R.
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Geffers, Klaus; and Drabert, Fritz. Chair having synchronously coupled tiltable seat and back rest. 4,143,910, Cl. 297-301.000.
Gelman, Stephanie S.; Maguire, Edward J., Jr.; and Guilloty, Haydee

R., to Procter & Gamble Company, The. Microwave energy moderating bag. 4,144,438, Cl. 219-10.55E.
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Beltran, Adrian M.; and Schilling, William F., 4,144,380, Cl. 428-679.000.
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Girard, Roland T.; Rice, George A.; and DeTommasi, Arthur N., 4,144,418, Cl. 200-2.000.
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Harris, Raymond W.; and Sherman, Ralph R., Jr., 4,144,499, Cl. 325-470.000.
Harris, Samuel C., Jr.; and Hewitt, Terry L., 4,144,560, Cl. 364-113.000.
Hauck, Harold S., 4,144,436, Cl. 219-10.55F.
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Rinde, John E.; and Perry, Richard M., 4,144,514, Cl. 335-229.000.
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MacIver, Bernard A.; and Greenstein, Eugene, 4,144,100, Cl. 148-1.500.
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Gerin, Albert A.; and Blanc, Claude G. Solar heat trap with double fluid circuits. 4,143,643, Cl. 126-271.000.
Germerdonk, Rolf; Borger, Gotz-Gerald; and Huning, Werner, to Bayer Aktiengesellschaft. Method of purifying gases by combustion. 4,144,313, Cl. 423-210.000.
Gerry, Martin E. Multiple double energy modulation ignition system. 4,144,476, Cl. 315-209.00R.
Gertz, Arthur R. Chalk line device. 4,143,462, Cl. 33-87.000.
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Gidley, John A. F.; Irving, Barry F.; and Johnson, Barry K., to Imperial Metal Industries (Kynoch) Limited. Support. 4,144,108, Cl. 156-60.000.
Giebler, Fritz; and Hotzel, Oskar, to Siemens Aktiengesellschaft. Shifting arrangement for exact space positioning of a writing carriage in typewriters. 4,143,980, Cl. 400-322.000.
Gill, Robert E., Jr.; and Williams, Michael. Apparatus for selectively dispensing pasty substances. 4,143,688, Cl. 141-104.000.
Gillette Company, The: *See—*
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Girard, Roland T.; Rice, George A.; and DeTommasi, Arthur N., to General Electric Company. Voltage responsive switch. 4,144,418, Cl. 200-2.000.
Giuffre, Luigi; de Nora, Vittorio; and Spaziante, Placido, to Oronzio de Nora Impianti Elettrochimici S.p.A. Novel copolymers and diaphragms made therefrom. 4,144,227, Cl. 526-40.000.
GKN Windsor GmbH: *See—*
Strassheimer, Herbert; and Ubelacker, Florian, 4,143,974, Cl. 366-78.000.
Gladden, Kenneth D., to Caterpillar Tractor Co. Lift top quench hardening press. 4,143,863, Cl. 266-118.000.
Glasser, Herman; and Panetta, Patrick F., to Victoreen, Inc., by said Herman Glasser. Method and apparatus for assay and storage of radioactive solutions. 4,144,461, Cl. 250-506.000.
Glatt, Jack E.; Detzel, Jacob J.; and Lane, Richard, to Keolyn Plastics, Inc. Method and apparatus for molding a composite plastic article. 4,144,303, Cl. 264-138.000.
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Godfrey, David E., to General Electric Company. Coal seam sensor. 4,143,552, Cl. 73-579.000.
Goebel, Herbert, to Siemens Aktiengesellschaft. X-ray powder diffractometer. 4,144,450, Cl. 250-272.000.
Goettler, Ernst; and Gruter, Otto, to Siemens Aktiengesellschaft. CCD Storage module. 4,144,588, Cl. 365-183.000.
Goldberg, Allan M.; and Malewicki, Douglas J., to American Hospital Supply Corporation. Additive cap and snap-on retention ring for medical liquid container. 4,143,786, Cl. 215-274.000.
Goloff, Alexander; Keske, Frank E.; Stafford, Darrell E.; and Stratton, Michael K., to Caterpillar Tractor Co. Speed controlled hydraulic lifter for internal combustion engines. 4,143,629, Cl. 123-90.160.
Gomberg, Henry J.; Lewis, John G.; Teichmann, Theodor; and Teitel, Robert J., to Texas Gas Transmission Corporation. Means and method for processing chemicals with radiation. 4,144,150, Cl. 204-157.10H.
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Good, Gary L. Mold for forming joints between conduits. 4,143,849, Cl. 249-11.000.
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Goulding Chemicals Limited: *See—*
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Gow, Ian R. E., executor: *See—*
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Graewe, Eberhard; and Krajeweski, Siegfried, to Vereinigte Flugtechnische Werke-Fokker GmbH. Measuring the speed of an aircraft. 4,143,548, Cl. 73-181.000.
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Griehl, Wolfgang: *See—*
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Griffin, Lee E. Machine for shelling beans or peas and for separating particles therefrom. 4,143,665, Cl. 130-30.00H.

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Vainshtein, Viktor A.; Kulbakh, Valter O.; Etingov, Evgeny D.; Naumchik, Grigory N.; Ekzemplyarov, Oleg N.; Mikhailets, Georgy A.; Grinberg, Grigory E.; and Egorenkova, Alla N., 4,144,328, Cl. 424-180.000.

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Guise, Geoffrey B., to Commonwealth Scientific and Industrial Research Organization. Preparation of bisulphite adducts of biuret-polyisocyanates. 4,144,268, Cl. 260-513.00N.

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Dutkewych, Oleh B.; Gaputis, Charles A.; Gulla, Michael; and Levy, Leonard R., 4,144,119, Cl. 156-659.000.

Gulyaev, Genrikh V.: *See—*
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Habib, Emile E., to Milliken Research Corporation. Product and process. 4,144,027, Cl. 8-127.600.

Hachikawa, Kazumitsu; and Ogawa, Masaaki, to Hitachi Shipbuilding & Engineering Co. Ltd. Can end feeder. 4,143,779, Cl. 414-411.000.

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Haddock, John W., to Hall & Pickles Limited. Mineral cutting pick insert shape. 4,143,920, Cl. 299-79.000.

Hager, Walter, to Pfaff Industriemaschinen GmbH. Sewing machine with differential work transport. 4,143,607, Cl. 112-209.000.

Haggquist, Benjamin J.: *See—*
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Haglund, James E., to Central Container Corporation. Collapsible shipping container for circuit boards. 4,143,763, Cl. 206-334.000.

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LaHaye, Paul G.; Bjerklie, John W.; and Gallant, Gerald G., Jr., 4,144,020, Cl. 432-19.000.

Hakim, Louise Z. Pacifier method of construction. 4,143,452, Cl. 29-434.000.

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Hall, Ralph F.; and Huffman, William F., to SmithKline Corporation. Monocyclic beta-lactams with antibacterial activity. 4,144,333, Cl. 424-244.000.

Hallais, Jean P.: *See—*
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Halliburton Company: *See—*
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Hallstrom, Olof A. Reciprocating conveyor. 4,143,760, Cl. 198-750.000.

Hama, Masaaki: *See—*
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Hamer, George D.: *See—*
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Hamoto, Hideaki; Ogino, Maao; Yoshida, Mitsunobu; Mishima, Yoshinari; and Yoshizawa, Akiho, to Kabushiki Kaisha Takarabune; and Sharp Kabushiki Kaisha. Whipped cream making machine. 4,144,293, Cl. 261-93.000.

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Winterbotham, Peter; and Hampson, Jeffrey D., 4,144,201, Cl. 252-547.000.

Hamrick, Joseph T.; and Rose, Leslie C., to World Energy Systems. Windmill operated system. 4,143,522, Cl. 62-324.000.

Hanada, Tsuneo: *See—*
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Hann, Paul D.: *See—*
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Hansen, Gary G.; Pengue, Leonard M.; and Watkin, Theodore, to Pitney-Bowes, Inc. Unit document feeding mechanism. 4,143,981, Cl. 400-628.000.

Hantelmann, Paul, to Messer Griesheim GmbH. Electrode method for welding thin steel sheets. 4,144,441, Cl. 219-74.000.

Hara, Osamu: *See—*
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Hardinge Brothers, Inc.: *See—*
DeBiasse, Richard L., 4,143,564, Cl. 82-19.000.

Hardy, Frank M.: *See—*
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Harlang, Bent, to Kevi A/S. Castor with a brake device. 4,143,442, Cl. 16-35.00R.

Harnischfeger Corporation: *See—*
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Harris Corporation: *See—*
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Harris, James A.: *See—*
Mod, Robert R.; Harris, James A.; Arthur, Jett C., Jr.; Magne, Frank C.; Sumrell, Gene; and Novak, Arthur F., 4,144,256, Cl. 260-402.500.

Harris, Mary A. Detachable support members. 4,143,845, Cl. 248-221.200.

Harris, Raymond W.; and Sherman, Ralph R., Jr., to General Electric Company. Search circuit for a radio receiver. 4,144,499, Cl. 325-470.000.

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Harte, Richard A., to International Diagnostic Technology, Inc. Fluorometric system, method and test article. 4,144,452, Cl. 250-302.000.

Hartkopf, Heinz; and Schneider, Horst, to Th. Kieserling & Albrecht. Workpiece feed channel. 4,143,534, Cl. 72-98.000.

Hartl, Walter, to U.S. Philips Corporation. Rotating anode X-ray tube. 4,144,471, Cl. 313-60.000.

Hartman, Seymour; and Ozkan, Mulayim, to Champion International Corporation. Bark extended phenolic resin adhesive composition and process for preparing same. 4,144,205, Cl. 260-7.000.

Hartmann, Heinrich: *See*—
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Hartwell, George E.; and Garrou, Philip E., to Dow Chemical Company, The. Amine-resin supported rhodium-cobalt carbonyl bimetallic clusters as novel hydroformylation catalysts. 4,144,191, Cl. 252-428.000.

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Hasegawa, Katsuji, to Meinan Machinery Works, Inc. Method of piling veneer sheets. 4,144,112, Cl. 156-313.000.

Hashiba, Kunizo: *See*—
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Hasker, Jan; van Ijzendoorn, Petrus R.; and Roelofs, Hendrik, to U.S. Philips Corporation. Method of making a low-pressure gas discharge lamp. 4,143,447, Cl. 29-25.130.

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Hastings, Donald R., to Nordson Corporation. Electrostatic spray coating gun. 4,143,819, Cl. 239-707.000.

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Hatch, Michael R., to International Business Machines Corporation. Damping vibrations in voice coil actuator. 4,144,466, Cl. 310-13.000.

Hatfield, Lowell D., to Eli Lilly and Company. Cephalosporin displacement reaction. 4,144,391, Cl. 544-21.000.

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Hauber, Peter F. Motorized vent operator. 4,143,556, Cl. 74-25.000.

Hauck, Harold S., to General Electric Company. Microwave oven excitation system for promoting uniformity of energy distribution. 4,144,436, Cl. 219-10.55F.

Hauni-Werke Korber & Co. Kg.: *See*—
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Hauser, Peter J.; Hendrix, James E.; and Kuhn, Hans H., to Milliken Research Corporation. Tint compositions for nylon having improved fugitivity properties. 4,144,028, Cl. 8-164.000.

Haustein, Norman E., to General Motors Corporation. Exhaust flow directional device. 4,143,731, Cl. 180-64.00A.

Havstad, Harold R.; Ruksenas, Miguel A.; and Rowland, Robert O., to Hudson Oxygen Therapy Sales Company. Lung volume exerciser. 4,143,872, Cl. 272-99.000.

Hawkridge, Fredrick M.; and Landrum, Harlie L., to Virginia Commonwealth University. Electrolytic production of stable methyl viologen film. 4,144,143, Cl. 204-72.000.

Hayakawa, Mitsutaka: *See*—
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Hayhurst, Thomas S. Leewardly aligned sail support system. 4,143,611, Cl. 114-90.000.

Haynes, Eugene M., to Owens-Corning Fiberglas Corporation. Salvaging and restraining recuperator from collapse. 4,143,708, Cl. 165-76.000.

Heberlein, G. Erich, Jr.: *See*—
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Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph H., to Janssen Pharmaceutica N.V. Novel 1-(1,3-dioxolan-2-ylmethyl)-1H-imidazoles. 4,144,346, Cl. 424-273.00R.

Heim, Edward L., to Coin Acceptors, Inc. Serration detector. 4,143,750, Cl. 194-97.00R.

Heimann, Joseph B. Method and apparatus for making a secondary key for a lock mechanism. 4,143,582, Cl. 90-13.050.

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Heitland, Herbert; Kroll, Rudolf; and Grundmann, Edgard, to Volkswagenwerk Aktiengesellschaft. Apparatus for producing useful heat from solar radiation. 4,143,644, Cl. 126-271.000.

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Herrmann, Herbert: *See*—
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Hildebrand, Dietrich; and Gribnau, Thomas, to Bayer Aktiengesellschaft. Polymeric carrier bound ligands. 4,144,128, Cl. 195-63.000.

Hill, John A., Jr., to Ultimate Engineering Corporation. Control and transfer of energy. 4,143,814, Cl. 237-1.00A.

Hiller, Alexander J.; and Hardy, Frank M. Exercise recorder. 4,144,568, Cl. 364-410.000.

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Holladay, Samuel P., to United States of America, Navy. Folding fin assembly detent. 4,143,838, Cl. 244-3.280.
Hollandse Signaalapparaten B.V.: *See*—
Van Hijfte, Herman M.; and Bergman, Jan, 4,144,533, Cl. 343-7.0AG.
Hollett, Reginald; and Skinner, Robert T. J., to Lucas Industries Limited. Fuel pumping apparatus. 4,144,000, Cl. 417-462.000.
Hollwarth, Armin. Plant growing receptacle. 4,143,487, Cl. 47-59.000.
Holmes, Gordon W., to Ortho Pharmaceutical Corporation. Instrument and method for inserting an intrauterine contraceptive device. 4,143,656, Cl. 128-130.000.
Holmes, Jerry D.: *See*—
Schmidt, Robert R., III; and Holmes, Jerry D., 4,143,858, Cl. 526-48.200.
Holmes, John P.; and Nazareth, Edward R. L., to Hospital Linen Service Facility. Device for arranging and transporting articles of laundry. 4,143,476, Cl. 38-7.000.
Holt, David: *See*—
Chapman, Frank; and Holt, David, 4,144,538, Cl. 346-153.000.
Holton, Robert J.; and Waterson, James F., to Eaton Corp. Self-locking, self-retaining fastener. 4,143,696, Cl. 151-41.750.
Holtz, Roger E.; Tilson, Bernard A.; and Woods, Gordon D., to Bell Telephone Laboratories, Incorporated. Telephone ringing extender. 4,144,408, Cl. 179-16.00E.
Holz, Gunter: *See*—
Gruber, Wolfgang; Bergmeyer, Hans U.; Nelbock-Hochstetter, Michael; Beaucamp, Klaus; Holz, Gunter; Gramsall, Johanna; and Lang, Gunter, 4,144,129, Cl. 195-66.00R.
Home Metal Products Company a Division of Mobex Corporation: *See*—
Sampsel, Kenneth E., 4,143,646, Cl. 126-299.00D.
Home of Champions, S. A.: *See*—
Tomar, Julius, 4,144,297, Cl. 264-45.500.
Hook, Klaus: *See*—
Frensch, Heinz; Albrecht, Konrad; and Hook, Klaus, 4,144,050, Cl. 71-120.000.
Hooper, Richard: *See*—
Nicholas, Charles P.; and Hooper, Richard, 4,143,478, Cl. 43-42.100.
Hopkins, William C.: *See*—
Rainer, Norman B.; Hoelzel, Charles B.; and Hopkins, William C., 4,143,666, Cl. 131-2.000.
Hoppe, Walter; Junger, Hans; and Weissenfels, Franz, to Dynamit Nobel Aktiengesellschaft. Metallurgical vessel. 4,143,867, Cl. 266-272.000.
Hospital Linen Service Facility: *See*—
Holmes, John P.; and Nazareth, Edward R. L., 4,143,476, Cl. 38-7.000.
Hotzel, Oskar: *See*—
Giebler, Fritz; and Hotzel, Oskar, 4,143,980, Cl. 400-322.000.
Hou, Karl L. Adjustable throat venturi scrubber. 4,144,041, Cl. 55-226.000.
Howald, Adolf: *See*—
Stary, Rudolf; and Howald, Adolf, 4,144,054, Cl. 75-68.00R.
Howe, Robert K.: *See*—
Franz, John E.; and Howe, Robert K., 4,144,047, Cl. 71-90.000.
HTL Industries, Inc.: *See*—
Sitabkhan, Abdul N., 4,143,545, Cl. 73-146.800.
Hudson Oxygen Therapy Sales Company: *See*—
Havstad, Harold R.; Ruksenas, Miguel A.; and Rowland, Robert O., 4,143,872, Cl. 272-99.000.
Huffman, William F.: *See*—
Hall, Ralph F.; and Huffman, William F., 4,144,333, Cl. 424-244.000.
Huggett, Richard D. J.: *See*—
Burton, John D.; and Huggett, Richard D. J., 4,143,855, Cl. 254-150.00R.
Hughes Aircraft Company: *See*—
Roesner, Bruce B., 4,144,098, Cl. 148-1.500.
Humbert, Heiko: *See*—
Fuchs, Gundolf; Humbert, Heiko; and Pirck, Dietrich, 4,144,208, Cl. 260-27.00R.
Humpherys, Bernarr H.: *See*—
Prickett, Michael J.; and Humpherys, Bernarr H., 4,144,534, Cl. 343-6.5LC.
Huning, Werner: *See*—
Germerdonk, Rolf; Borger, Gotz-Gerald; and Huning, Werner, 4,144,313, Cl. 423-210.000.
Hussain, Anwar: *See*—
Higuchi, Takeru; and Hussain, Anwar, 4,144,317, Cl. 424-21.000.
Husslein, Julius; and Hertel, Wilhelm, to Bosch-Siemens Hausgerate GmbH. Dish for holding food to be heated in a microwave cooking chamber. 4,143,647, Cl. 126-390.000.
Hustedt, Helmut: *See*—
Kula, Maria-Regina; Kroner, Karl-Heinz; Stach, Wolfgang; Hustedt, Helmut; Durekovic, Andija; and Grandja, Stefica, 4,144,130, Cl. 195-66.00R.
Hutcheon, Robert S., to Raytheon Company. Frequency measuring apparatus. 4,144,491, Cl. 324-82.000.
Hutchinson, Florence M., executrix: *See*—
Hutchinson, William M., deceased; and Hutchinson, Florence M., executrix, 4,144,175, Cl. 252-1.000.
Hutchinson, William M., deceased; and Hutchinson, Florence M., executrix, 4,144,187, Cl. 252-364.000.
Hutchinson, William M., deceased; and by Hutchinson, Florence M., executrix, to Phillips Petroleum Company. Constant boiling admixtures. 4,144,175, Cl. 252-1.000.
Hutchinson, William M., deceased; and by Hutchinson, Florence M., executrix, to Phillips Petroleum Company. Constant boiling admixtures. 4,144,187, Cl. 252-364.000.
Hyatt, Gilbert P. Voice signal processing system. 4,144,582, Cl. 364-900.000.
Hydroacoustics, Inc.: *See*—
Selsam, Roger L., 4,143,585, Cl. 91-276.000.
Igea, Gilbert L.; Mirtain, Henri J.; and Uniroyal. Inner tube assembly for run-flat tires. 4,143,697, Cl. 152-340.000.
Iida, Kosuke: *See*—
Shikinami, Yasuo; Kimura, Ryuichi; Yoshikawa, Yoshinobu; Iida, Kosuke; and Hata, Kunihiro, 4,144,153, Cl. 204-159.200.
Iizuka, Haruhiko; and Yasuhara, Seishi, to Nissan Motor Company, Limited. Exhaust gas recirculated engine with variable cylinder disablement control. 4,143,635, Cl. 123-198.00F.
Ikeda, Masahiko: *See*—
Ito, Yoshinori; Kawai, Masaaki; and Ikeda, Masahiko, 4,144,443, Cl. 219-137.700.
Ikeda, Saizo: *See*—
Ikeda, Tadayoshi; Ikeda, Saizo; Hashimoto, Kaname; and Higuchi, Masaru, 4,144,221, Cl. 260-33.4SB.
Ikeda, Tadayoshi; Ikeda, Saizo; Hashimoto, Kaname; and Higuchi, Masaru, to Daicel Ltd. Curable organopolysiloxane coating composi-

tion containing bicyclic amidine curing catalyst. 4,144,221, Cl. 260-33.4SB.
Ikeda, Yuji, to Sansui Electric Co., Ltd. Negative feedback amplifiers of PWM-type. 4,144,502, Cl. 330-207.00A.
Ikegaya, Masashi: *See*—
Takahashi, Toshiro; Ikegaya, Masashi; and Ozaki, Masamichi, 4,144,142, Cl. 204-58.000.
Ikenoue, Shinpei; Masuda, Takao; and Sekikawa, Nobuyoshi, to Fuji Photo Film Co., Ltd. Thermally developable light-sensitive material. 4,144,072, Cl. 96-114.100.
Imai, Haruo; Oohama, Tadashi; Yamaguchi, Ryozo; and Ninomiya, Kunihiro, to Mitsubishi Chemical Industries Limited. Process for the purification of steroids. 4,144,254, Cl. 260-397.400.
Imai, Kiyoshi: *See*—
Ishibashi, Hiroshi; Sakai, Nobuo; Imai, Kiyoshi; and Nakajima, Junya, 4,144,068, Cl. 96-60.00R.
Imokawa, George: *See*—
McCammon, John W.; and Imokawa, George, 4,144,506, Cl. 333-26.000.
Impastato, Leona R. Dart depth gauge. 4,143,461, Cl. 33-16.000.
Imperial Metal Industries (Kynoch) Limited: *See*—
Gidley, John A. F.; Irving, Barry F.; and Johnson, Barry K., 4,144,108, Cl. 156-60.000.
Indesit Industria Elettrodomestici: *See*—
Dini, Roberto, 4,144,546, Cl. 358-174.000.
Indesit Industria Elettrodomestici Italiana S.p.A.: *See*—
Farina, Attilio; and Zappala, Giuseppe, 4,144,479, Cl. 315-408.000.
Ing. Alfred Schmidt GmbH, Firma: *See*—
Schmidt, Alfred; and Fritz, Gunther, 4,143,475, Cl. 37-43.00C.
Ing. C. Olivetti & C., S.p.A.: *See*—
Zaffignani, Giovanni; and Casalino, Carlo, 4,144,407, Cl. 178-50.000.
Ing. Karl Vockenhuber: *See*—
Schild, Josef, 4,143,950, Cl. 352-91.00C.
Inland Steel Company: *See*—
Kim, Yong-wu, 4,144,378, Cl. 428-653.000.
Patil, Ram S.; and Polakowski, John N., 4,144,379, Cl. 428-653.000.
Inoue, Akio; Iwasa, Toshio; Sasaguri, Kiichiro; Amano, Toshihiko; and Nomura, Junji, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing acrylonitrile polymer film. 4,144,299, Cl. 264-558.000.
Inoue, Kazuo, to Citizen Watch Commpany Ltd. Semiconductor device insulation method. 4,143,456, Cl. 29-588.000.
Inoue, Morio: *See*—
Itoh, Kunio; and Inoue, Morio, 4,144,503, Cl. 331-94.50H.
Inoue, Noriyuki: *See*—
Yoneyama, Masakazu; Inoue, Noriyuki; Tsuji, Nobuo; and Kameoka, Kimitaka, 4,144,069, Cl. 96-63.000.
Inoue, Shoji: *See*—
Lagow, Richard J.; Adcock, James L.; and Inoue, Shoji, 4,144,374, Cl. 428-334.000.
Inouye, Henry: *See*—
Liu, Chain T.; and Inouye, Henry, 4,144,059, Cl. 75-170.000.
Institut Armand-Frappier: *See*—
Corbeil, Michel, 4,144,136, Cl. 195-127.000.
International Business Machines Corporation: *See*—
Bouknecht, Max A.; and Vergari, Louis P., 4,144,565, Cl. 364-200.000.
Davie, Neil R.; and Lambiotte, Joseph C., 4,144,539, Cl. 346-160.000.
Edmonds, Harold D.; and Markovits, Gary, 4,144,099, Cl. 148-1.500.
Faris, Sadeg M., 4,144,465, Cl. 307-277.000.
Fossum, Bryce G.; Markson, Kenneth J.; Schloss, Phillip C.; and Wing, James W., 4,144,447, Cl. 235-92.0PE.
Hatch, Michael R., 4,144,466, Cl. 310-13.000.
Heuer, Dale A.; Schloss, Phillip C.; and Schroeder, Larry L., 4,144,563, Cl. 364-200.000.
Lee, James H.; Lessmann, Bernd K. S.; and Satya, Akella V., 4,144,493, Cl. 324-158.00R.
Pisciotta, Emilio C.; and Thornock, Tony G., 4,144,448, Cl. 235-301.000.
Powell, Kenneth E., 4,144,584, Cl. 364-900.000.
Rideout, Vincent L., 4,144,101, Cl. 148-1.500.
International Diagnostic Technology, Inc.: *See*—
Harte, Richard A., 4,144,452, Cl. 250-302.000.
International Minerals & Chemical Corp.: *See*—
Khachaturian, Arek, 4,144,215, Cl. 260-31.20N.
International Nickel Company, Inc., The: *See*—
Antonioni, Thomas N., 4,143,865, Cl. 266-161.000.
Smith, Darrell F., Jr.; Clatworthy, Edward F.; and Wenschhof, Donald E., Jr., 4,144,102, Cl. 148-2.000.
International Radioimmune Systems, Inc.: *See*—
Acevedo, Hernan F.; Slifkin, Malcolm; and Dalbow, Milton H., 4,144,031, Cl. 23-230.00B.
International Standard Electric Corporation: *See*—
Leggett, Norman D.; and Epworth, Richard E., 4,144,504, Cl. 331-94.50P.
Ubel, Helmut, 4,143,842, Cl. 246-182.00B.
International Telephone and Telegraph Corp.: *See*—
Goodman, David S.; Curley, James H.; and Langenbach, Jack E., 4,143,935, Cl. 339-99.00R.
Saxon, B. Ronald, 4,144,415, Cl. 179-99.000.
U, Aung S., 4,144,586, Cl. 365-156.000.
International Totalizing System: *See*—
Otten, David M., 4,143,749, Cl. 194-1.00N.
Intertrac Viehmann & Co.: *See*—
Klaus, Helmuth; Fass, Carl; and Lause, Heinz, 4,143,898, Cl. 293-137.000.
Inui, Taiji: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Naganawa, Hiroshi; Ishizuka, Masaaki, all of; Shibamoto, Norio; Oki, Toshikazu; and Inui, Taiji, 4,144,329, Cl. 424-181.000.
Inventa AG Fur Forschung und Patent-verwertung, Zurich: *See*—
Maschek, Max; Capaul, Marcel; and Griehl, Wolfgang, 4,144,285, Cl. 260-873.000.
Ireland, Alfred L., to Edward Rose (Birmingham) Limited. Roof means for vehicles. 4,143,907, Cl. 296-137.00C.
Irving, Barry F.: *See*—
Gidley, John A. F.; Irving, Barry F.; and Johnson, Barry K., 4,144,108, Cl. 156-60.000.
Ishibashi, Hiroshi; Sakai, Nobuo; Imai, Kiyoshi; and Nakajima, Junya, to Fuji Photo Film Co., Ltd. Method for color photographic processing. 4,144,068, Cl. 96-60.00R.
Ishiguro, Yasuo; and Wakazono, Kenji, to Copal Company Limited. Controlling circuit for electric shutters. 4,143,958, Cl. 354-267.000.
Ishihara Sangyo Kaisha, Ltd.: *See*—
Takahata, Kei; Murasawa, Sadao; and Maruo, Masatsuyo, 4,144,184, Cl. 252-62.10L.
Ishihara, Shunichi: *See*—
Ando, Yujiro; Ishihara, Shunichi; Murakawa, Shuji; and Ohara, Katsunobu, 4,143,965, Cl. 355-35.00C.
Ishii, Hisao: *See*—
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Ishii, Takakazu: *See*—
Ito, Yasuro; Kaga, Hideharu; Yamamoto, Yasuhiro; Sumita, Tadayuki; Suzuki, Kuniomi; Kuroha, Kenji; Ishii, Takakazu; and Hayakawa, Mitsutaka, 4,143,541, Cl. 73-55.000.
Ishino, Keizo: *See*—
Kudo, Shiro; Ishino, Keizo; and Akaba, Kunihisa, 4,144,358, Cl. 426-582.000.
Ishizuka, Masaaki, all of: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Naganawa, Hiroshi; Ishizuka, Masaaki, all of; Shibamoto, Norio; Oki, Toshikazu; and Inui, Taiji, 4,144,329, Cl. 424-181.000.
Ishizuka, Yutaka: *See*—
Shibuya, Tsunenori; Ishizuka, Yutaka; and Nakamura, Teruo, 4,144,002, Cl. 418-76.000.
Isobe, Yoshiyuki: *See*—
Wada, Shinji; and Isobe, Yoshiyuki, 4,144,096, Cl. 136-89.00P.
Isothermic Systems Limited: *See*—
Creswick, William E.; and Rounthwaite, Cyril F. T., 4,143,703, Cl. 165-1.000.
Itani, Seiichi, to Kubota Ltd. Electronic weighing apparatus. 4,143,724, Cl. 177-25.000.
Itani, Takashi: *See*—
Suzaki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takahashi, Kiyoshi; and Takimoto, Hiroyuki, 4,143,951, Cl. 352-169.000.
Ito, Hiroshi: *See*—
Shindo, Yoshio; and Ito, Hiroshi, 4,143,563, Cl. 74-867.000.
Ito, Sadao; Yoshikawa, Noriaki; and Komura, Mitsuru, to Nippon Telegraph and Telephone Public Corporation. Method of assigning a radio channel to a calling mobile body of mobile communication system and radio channel assigning system therefor. 4,144,412, Cl. 179-2.0EB.
Ito, Yasuro; Kaga, Hideharu; Yamamoto, Yasuhiro; Sumita, Tadayuki; Suzuki, Kuniomi; Kuroha, Kenji; Ishii, Takakazu; and Hayakawa, Mitsutaka, to Ito, Yasuro; and Taisei Corporation. Method and device for measuring the characteristics of plastic fluid and control system for pouring the same into moulds. 4,143,541, Cl. 73-55.000.
Ito, Yoshinori; Kawai, Masaaki; and Ikeda, Masahiko, to Sumitomo Metal Industries Limited. Apparatus for horizontal fillet welding of steel plates. 4,144,443, Cl. 219-137.700.
Itoh, Hitoshi; and Momiyama, Iwao, to Kansai Paint Co., Ltd. Inorganic coating composition. 4,144,074, Cl. 106-1.170.
Itoh, Kunio; and Inoue, Morio, to Matsushita Electric Industrial Co., Ltd. Semiconductor laser with light guide. 4,144,503, Cl. 331-94.50H.
Itooka, Eiyoshi: *See*—
Yoshida, Ryo; Sumida, Seizo; Itooka, Eiyoshi; Noguchi, Hiroshi; and Kamoshita, Katsuzo, 4,144,049, Cl. 71-120.000.
ITT Industries, Inc.: *See*—
Ade, Rolf; Prohaska, Hans; and Schmid, Eckhardt, 4,143,488, Cl. 417-366.000.
Schadow, Rudolf, 4,144,419, Cl. 200-16.00R.
Iuchi, Munenori, to Sumitomo Rubber Industries, Ltd. Metal mold for vulcanization of tires. 4,144,006, Cl. 425-33.000.
Ivanov, Alexei I.: *See*—
Malyshev, Boris N.; Saljuk, Viktor A.; Skobelkin, Oleg K.; Toschakov, Robert A.; Brekhov, Evgeny I.; Egorov, Evgeny I.; and Ivanov, Alexei I., 4,143,660, Cl. 128-303.100.
Ivanov, Vladimir I.: *See*—
Pyatnitskaya, Irina N.; Ivanov, Vladimir I.; Borovkova, Nina K.; and Naidenova, Nina G., 4,144,348, Cl. 424-274.000.
Ivett, Robert W. Lithographic press dampening system. 4,143,596, Cl. 101-148.000.
Ivony, Jozsef; Lendvai, Imre; Szucs, Laszlo; and Szekely, Laszlo. Hydraulic port control apparatus, e.g. for motor vehicle servo steering gear. 4,143,676, Cl. 137-625.230.
Iwasa, Toshio: *See*—
Inoue, Akio; Iwasa, Toshio; Sasaguri, Kiichiro; Amano, Toshihiko; and Nomura, Junji, 4,144,299, Cl. 264-558.000.

Iwasaki Tsushinki Kabushiki Kaisha: *See*—
Kodama, Tadashi; Murakami, Masayuki; Kimeda, Tsuneji; Matsuoka, Tadahiko; Hara, Osamu; and Tsukiyama, Satoru, 4,144,413, Cl. 179-90.00R.

J. B. Foote Foundry Co., The: *See*—
Hauser, Hans, 4,143,973, Cl. 366-54.000.

J. Bobst & Fils, S.A.: *See*—
Wieser, Louis, 4,143,771, Cl. 209-583.000.

J. I. Case Company: *See*—
Cochran, Gary L.; and Wilson, Charles D., 4,143,783, Cl. 414-715.000.
Lenius, Norbert W.; and Stearn, Richard A., 4,143,781, Cl. 414-460.000.

J. K. and Susie L. Wadley Research Institute and Blood Bank: *See*—
Dorn, Gordon L.; and Land, Geoffrey A., 4,144,133, Cl. 195-100.000.

J. M. Huber Corporation: *See*—
Abercrombie, William F., Jr., 4,144,083, Cl. 106-288.00B.
Abercrombie, William F., Jr., 4,144,084, Cl. 106-288.00B.
Abercrombie, William F., Jr., 4,144,085, Cl. 106-288.00B.
van der Heem, Peter, 4,144,081, Cl. 106-193.00J.
Wason, Satish K., 4,144,321, Cl. 424-49.000.

Jackson, George; and Wooddisse, John, to British Steel Corporation. Apparatus for production of metal strip. 4,144,009, Cl. 425-79.000.

Jackson, John R.: *See*—
Erspamer, James R.; Jackson, John R.; Misch, Roger A.; and Waldrop, John L., 4,143,467, Cl. 33-356.000.

Jacob, Guy M.; and Hallais, Jean P., to U.S. Philips Corporation. Vapor deposition of single crystal gallium nitride. 4,144,116, Cl. 156-611.000.

Jacobi, Haireddin: *See*—
Boltze, Karl-Heinz; Seidel, Peter-Rudolf; Jacobi, Haireddin; and Schwarz, Helmut, 4,144,336, Cl. 424-248.540.

Jacobi, Manfred: *See*—
Kuesters, Werner; Jacobi, Manfred; and Osterloh, Rolf, 4,144,156, Cl. 204-159.230.

Jacobson, Allan J.; Chianelli, Russell R.; and Whittingham, M. Stanley, to Exxon Research & Engineering Co. Cells having cathodes with vanadium-chalcogen-containing compounds. 4,144,384, Cl. 429-218.000.

Jacobson, Walter E., to Revere Corporation of America. Leverless scale sensor. 4,143,727, Cl. 177-211.000.

Jaffe, Wolfgang: *See*—
Herr, John A.; and Jaffe, Wolfgang, 4,143,606, Cl. 112-158.00E.

Jagenberg-Werke AG: *See*—
Schonmeier, Herbert, 4,143,572, Cl. 83-501.000.

Jalowiec, Phillip: *See*—
Trussell, Gerald C.; Caruth, James R.; Jalowiec, Phillip; and Pociask, Michael J., 4,144,573, Cl. 364-506.000.

James, Henry J.; and Young, Carter R., to Otis Engineering Corporation. Apparatus for treating or completing wells. 4,143,712, Cl. 166-72.000.

Jandeska, William F.; and Netherton, Charles F., to General Motors Corporation. Method of fabricating rare earth-transition metal magnets. 4,144,060, Cl. 75-226.000.

Janiak, P. Stefan: *See*—
Grill, Helmut; Zschocke, Rainer H.; Wagner, Josef; Hofrichter, Gernot; and Janiak, P. Stefan, 4,144,351, Cl. 424-278.000.

Jansa, Milos; Spisiak, Juraj; and Ferdus, Stanislav, to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi. Mechanism for controlling the pressure fluid supply to the weft inserting nozzles of a multi-color jet loom. 4,143,682, Cl. 139-435.000.

Jansen, Jack F.: *See*—
Craig, Robert J. G.; Council, Clifton T.; and Jansen, Jack F., 4,143,451, Cl. 29-434.000.

Janssen Pharmaceutica N.V.: *See*—
Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph H., 4,144,346, Cl. 424-273.00R.

Japan Atomic Energy Research Institute: *See*—
Araki, Kunio; Makuuchi, Keizo; Takagi, Tohru; and Nakayama, Hiroyuki, 4,144,155, Cl. 204-159.220.

Jarrett, Howard S.; Kung, Harold H. C.; and Sleight, Arthur W., to Du Pont de Nemours, E. I., and Company. Photolysis of water using rhodate semiconductive electrodes. 4,144,147, Cl. 204-129.000.

Jauchen, Peter: *See*—
Guse, Gunter; Lukat, Ernst; Jauchen, Peter; Lenck, Wolfdieter; and Pietsch, Hanns, 4,144,157, Cl. 204-159.230.

Jayne, Gerald J. J.; and Askew, Herbert F., to Edwin Cooper and Company Limited. Lubricating oil additives. 4,144,247, Cl. 260-329.00P.

Jeanmart, Claude: *See*—
Barreau, Michel; Cotrel, Claude; and Jeanmart, Claude, 4,144,339, Cl. 424-251.000.

Jeanson, Rene H.; and Vagner, Daniel, to Societe Anonyme Francaise du Ferodo. Device for mounting a screw-rudder on a floating vehicle. 4,143,614, Cl. 115-41.0HT.

Jeffries, Alfred J. Golfer's training device. 4,143,877, Cl. 273-183.00E.

Jelen, Johann: *See*—
Hoehne, Klaus; Jelen, Johann; Heine, Diez; and Baatz, Rolf, 4,144,203, Cl. 260-3.300.

Jenne, Helmut: *See*—
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Jennings, Walter B., Jr.; McKnight, William B.; and Milton, Richard D., to United States of America, Army. Missile system using laser illuminator. 4,143,835, Cl. 244-311.000.

Jeung, Perry: *See*—
Uebbing, John J.; and Jeung, Perry, 4,143,809, Cl. 235-462.000.

John, Gunter: *See*—
Noack, Christian; Oliva, Klaus; Eistert, Theodor; Zumpf, Bernd; Spaida, Hans P.; John, Gunter; Pietschmann, Frank; Boltizar, Pal; Fabry, Istvan; Vida, Csongor; Lakos, Lajos; and Klement, Matyas, 4,143,504, Cl. 56-98.000.

Johnsen, Carsten I. Converting fossil fuel and liberated water constituents to electrical energy, synthetic natural gas or miscellaneous hydrocarbons while avoiding befoulment of environment. 4,143,515, Cl. 60-648.000.

Johnson, Anders A., to Monsanto Company. Solidification and crystallization of materials. 4,144,308, Cl. 422-245.000.

Johnson, Barry K.: *See*—
Gidley, John A. F.; Irving, Barry F.; and Johnson, Barry K., 4,144,108, Cl. 156-60.000.

Johnson & Johnson: *See*—
Boulton, Alan H., 4,144,370, Cl. 428-233.000.
Drelich, Arthur H.; and Lukacs, George J., 4,144,209, Cl. 260-29.20M.
Mohammed, Kasheed, 4,144,357, Cl. 426-96.000.

Johnson, Robert D., Sr., to CompAlarm Systems Co. Alarm system. 4,144,528, Cl. 340-500.000.

Johnson Rubber Company, The: *See*—
Ticknor, William C., 4,143,612, Cl. 114-219.000.

Johnston, Gordon L., to Donaldson Company, Inc. Three-stage dust collector. 4,144,043, Cl. 55-319.000.

Johnstone, Thomas V. Utility unit for camper vehicles. 4,143,902, Cl. 296-167.000.

Jones, David A., Jr.; and Schlatter, James M., to G. D. Searle & Co. Methionine^5-enkephalin sulfoxides and sulfones. 4,144,228, Cl. 260-112.50R.

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Seymour, Merritt W.; and Jones, James E., 4,143,429, Cl. 4-170.000.

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Zelahy, John W.; and Jones, Terry L., 4,144,433, Cl. 219-9.500.

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Josef Martin Feuerungsbau GmbH: *See*—
Martin, Johannes J.; Martin, Walter J.; and Kammholz, Horst, 4,143,603, Cl. 110-222.000.

Joshi, Devendra C.; and Sharma, Virendra. Valved volume dividing means. 4,143,430, Cl. 4-324.000.

Judson, Carl, Jr. Hammermills. 4,143,823, Cl. 241-73.000.

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Rock, Erich; and Mages, Bernhard, 4,143,846, Cl. 248-360.000.

Junger, Hans: *See*—
Hoppe, Walter; Junger, Hans; and Weissenfels, Franz, 4,143,867, Cl. 266-272.000.

Junginger, Erich: *See*—
Schnaibel, Eberhard; Junginger, Erich; Linder, Ernst; and Hertfelder, Wilhelm, 4,143,706, Cl. 165-26.000.

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Cottrell, Walter D., Jr.; and Jutte, Ralph B., Jr., 4,144,305, Cl. 264-247.000.

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Schauer, Friedrich, 4,143,930, Cl. 339-6.00R.

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Sakuma, Tadashi, 4,143,510, Cl. 58-85.500.
Takeda, Kazutoshi; and Kishi, Iwao, 4,144,382, Cl. 429-91.000.

Kabushiki Kaisha Honda Rokku: *See*—
Onitsuka, Nobuyuki, 4,143,551, Cl. 73-535.000.

Kabushiki Kaisha Imasen Denki Seisakusho: *See*—
Sakakibara, Yosihiro; and Awano, Takeshi, 4,143,911, Cl. 297-341.000.

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Furukawa, Ken; and Nunotani, Sadao, 4,143,719, Cl. 173-1.000.
Yamaguchi, Hiromasa, 4,143,994, Cl. 415-205.000.
Yoshida, Shuji; and Kaihori, Hiroyoshi, 4,143,903, Cl. 296-35.00R.

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Wada, Shinji; and Isobe, Yoshiyuki, 4,144,096, Cl. 136-89.00P.

Kabushiki Kaisha Takarabune: *See*—
Hamoto, Hideaki; Ogino, Maao; Yoshida, Mitsunobu; Mishima, Yoshinari; and Yoshizawa, Akiho, 4,144,293, Cl. 261-93.000.

Kabushiki Kaisha Yoneya Gangu: *See*—
Yonezawa, Hiroichi, 4,143,484, Cl. 46-104.000.

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Yoshikawa, Kunihiko, 4,143,745, Cl. 188-24.000.

Kaczmarek, Leonard: *See*—
DeRoss, Robert; and Kaczmarek, Leonard, 4,143,936, Cl. 339-276.00T.

Kaetzel, Gilbert C.: *See*—
Grimmell, William C.; Adams, Jim M.; Kaetzel, Gilbert C.; Fazzini, Robert P.; and DeZabala, Edward F., 4,143,770, Cl. 209-558.000.

Kaga, Hideharu: *See—*
Ito, Yasuro; Kaga, Hideharu; Yamamoto, Yasuhiro; Sumita, Tadayuki; Suzuki, Kuniomi; Kuroha, Kenji; Ishii, Takakazu; and Hayakawa, Mitsutaka, 4,143,541, Cl. 73-55.000.

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Kaiser, Gerhard; and Spieth, Erich, to Gustav Wagner Maschinenfabrik. Apparatus for keeping open the gap cut by a saw in a workpiece. 4,143,567, Cl. 83-113.000.

Kalfoglou, George; and Flournoy, Kenoth H., to Texaco Inc. Tertiary oil recovery process utilizing a preflush. 4,143,716, Cl. 166-274.000.

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Burger, Manfred R.; Gagel, Ernst; Kalmovicz, Rudolf; and Prechtl, Alfred, 4,143,523, Cl. 62-324.000.

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Utsunomiya, Tadashi; Ueda, Shigeo; Kamachi, Kiyotaka; and Wakamiya, Masatoshi, 4,143,454, Cl. 29-460.000.

Kambara, Hideki, to Hitachi, Ltd. Mass spectrometer. 4,144,451, Cl. 250-281.000.

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Kamholz, Kenneth, to Exxon Research & Engineering Co. Enhancing the thermal characteristics of magnetically stabilized fluidized beds. 4,143,469, Cl. 34-1.000.

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Martin, Johannes J.; Martin, Walter J.; and Kammholz, Horst, 4,143,603, Cl. 110-222.000.

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Yoshida, Ryo; Sumida, Seizo; Itooka, Eiyoshi; Noguchi, Hiroshi; and Kamoshita, Katsuzo, 4,144,049, Cl. 71-120.000.

Kamstra, Gordon E.; and Powers, Robert J. Fireplace heat exchange system. 4,143,638, Cl. 126-121.000.

Kandakov, Gennady P.; Miller, Viktor Y.; Sorokin, Lev A.; and Sukhorukov, Alexandr E. Regenerative heater. 4,143,704, Cl. 165-9.200.

Kanebo, Ltd.: *See—*
Yamanaka, Keio; Okamoto, Kazuo; and Mizukami, Yoshikatsu, 4,144,225, Cl. 260-45.9NC.

Kansai Paint Co., Ltd.: *See—*
Araki, Kunio; Makuuchi, Keizo; Takagi, Tohru; and Nakayama, Hiroyuki, 4,144,155, Cl. 204-159.220.
Itoh, Hitoshi; and Momiyama, Iwao, 4,144,074, Cl. 106-1.170.

Kao, Jar-lin: *See—*
Sheng, Ming N.; and Kao, Jar-lin, 4,144,399, Cl. 562-598.000.

Kao Soap Co., Ltd.: *See—*
Katabe, Kenichi; and Hirota, Takeshi, 4,144,178, Cl. 252-8.900.
Kawanaka, Hideo; Sato, Toshio; and Kasahara, Yosihiko, 4,144,176, Cl. 252-8.700.
Minegishi, Yutaka; and Arai, Haruhiko, 4,144,177, Cl. 252-8.800.
Miya, Bunji; Sawamoto, Yuzi; Hashiba, Kunizo; and Hisamitsu, Shizuo, 4,144,198, Cl. 252-466.00J.

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Karsh, Herbert; and Norton, J. Clyde, to Bell & Howell Company. Methods and apparatus for manufacturing tachometers. 4,143,538, Cl. 73-2.000.

Kasahara, Yosihiko: *See—*
Kawanaka, Hideo; Sato, Toshio; and Kasahara, Yosihiko, 4,144,176, Cl. 252-8.700.

Kasakoff, Sam. Coffee maker assembly. 4,143,590, Cl. 99-296.000.

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Matsuyama, Takashi; Tsuda, Hiroshi; and Kasuga, Muneo, 4,143,963, Cl. 355-14.000.

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Katahira, Yukio; and Morimoto, Toshiaki, to Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.). Aperture assembly. 4,143,952, Cl. 352-221.000.

Katzman, Allison W.: *See—*
Meyer, Burton C.; Nix, Donald F.; and Katzman, Allison W., 4,143,482, Cl. 46-43.000.

Kaufman, Jack W.: *See—*
Cox, Robert H.; and Kaufman, Jack W., 4,143,982, Cl. 401-280.000.

Kaufmann, Friedrich: *See—*
Drobnik, Stefan; Hild, Werner; Kaufmann, Friedrich; and Koschorke, Herbert, 4,144,186, Cl. 422-159.000.

Kawai, Masaaki: *See—*
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Kawamoto, Tamio: *See—*
Takeda, Noriyuki; and Kawamoto, Tamio, 4,144,424, Cl. 200-61.880.

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Okamoto, Hiroshi; and Matsui, Shigetomo, 4,143,536, Cl. 72-342.000.

Kaye, Robert M.; Eiloo, Gary A.; and Tucker, Thomas, to Washington Gas Light Company. Apparatus for testing metal detectors. 4,144,486, Cl. 324-3.000.

KC Enterprises: *See—*
Cox, James P., 4,143,444, Cl. 17-74.000.

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Groh, Edward F.; McDowell, William; Modjeski, Norbert S.; Keefe, Donald J.; and Groer, Peter, 4,144,454, Cl. 250-435.000.

Keiper Automobiltechnik GmbH & Co KG: *See—*
Hensel, Wolfgang; and Werner, Paul, 4,143,905, Cl. 296-65.00R.

Keller, Norman L., to Pullman Incorporated. Roller conveyor with alignment device. 4,143,755, Cl. 198-456.000.

Keller, Rudolf; and Topfl, Rosemarie, to Ciba-Geigy Corporation. Process for simultaneously providing synthetic textile materials with an antistatic and dirt-repellent finish. 4,144,026, Cl. 8-115.600.

Kellogg-Smith, Ogden. Internal combustion and steam engine. 4,143,518, Cl. 60-712.000.

Kelly, Ralph: *See—*
Willer, Sharon G.; Yust, Paul R.; and Kelly, Ralph, 4,144,319, Cl. 424-45.000.

Kelsey-Hayes Co.: *See—*
Main, John A.; and Trevarrow, David, 4,143,449, Cl. 29-159.100.
Miller, Roger L., 4,143,926, Cl. 303-92.000.

Kendall Company, The: *See—*
Patel, Bhupendra C., 4,143,651, Cl. 128-349.00B.

Kennecott Copper Corporation: *See—*
Frankiewicz, Theodore C.; and Lueders, Robert E., 4,144,310, Cl. 423-27.000.

Kent, Eric G., to Polysar Limited. Blends of trans-1,4-polymers and poly(epsilon-caprolactone). 4,144,223, Cl. 260-42.470.

Kenzler Engineering Company, Inc.: *See—*
Adams, Willard L., 4,144,088, Cl. 134-2.000.

Keolyn Plastics, Inc.: *See—*
Glatt, Jack E.; Detzel, Jacob J.; and Lane, Richard, 4,144,303, Cl. 264-138.000.

Kerr, Charles, III; and Krause, Daniel V., to Astronics Corporation. EL flashlight. 4,144,557, Cl. 362-84.000.

Keske, Frank E.: *See—*
Goloff, Alexander; Keske, Frank E.; Stafford, Darrell E.; and Stratton, Michael K., 4,143,629, Cl. 123-90.160.

Kesten, Martin; and Tevald, Frank W., to Preston Engravers, Inc. Resilient plate clamping means. 4,143,597, Cl. 101-378.000.

Kevi A/S: *See—*
Harlang, Bent, 4,143,442, Cl. 16-35.00R.

Keyes Fibre Company: *See—*
Sutton, John T., 4,143,805, Cl. 229-44.00R.

Khachaturian, Arek, to International Minerals & Chemical Corp. Binders for foundry mixes comprising polyisocyanate and styrene-allyl alcohol copolymer or alkylene oxide derivative thereof. 4,144,215, Cl. 260-31.20N.

Kheifets, Rafail E.: *See—*
Voloshin, Rafail Y.; Grachev, Leonid P.; Radutsky, Grigory A.; and Kheifets, Rafail E., 4,143,870, Cl. 270-47.000.

Khimenko, Lev T.; Mezhuev, Alexandr T.; Legeza, Anatoly V.; Sljusarev, Andrei K.; Gavrjuschenko, Anatoly D.; Chudakov, Vyacheslav A.; and Baranov, Mikhail I. Inductor for forming metals by the pressure of a pulsed magnetic field. 4,143,532, Cl. 72-56.000.

Khoe, Giok D., to U.S. Philips Corporation. Device for coupling a radiation source to a monomode optical transmission fibre with the aid of a resonant cavity. 4,143,940, Cl. 350-96.150.

Kiesel, Karl: *See—*
Braun, Heinz; Kiesel, Karl; and Stotz, Wolf-Gunter, 4,143,828, Cl. 242-65.000.

Kifferstein, Harry P.; and Kifferstein, Warren M. Sound-emitting toy flying saucer. 4,143,483, Cl. 46-74.00D.

Kifferstein, Warren M.: *See—*
Kifferstein, Harry P.; and Kifferstein, Warren M., 4,143,483, Cl. 46-74.00D.

Kim, Charles W.; and Liu, Chia-Seng, to Hercules Incorporated. Network structures having different cross-sections. 4,144,368, Cl. 428-105.000.

Kim, Keun Y.: *See—*
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Kim, Yong-wu, to Inland Steel Company. Aluminized low alloy steel. 4,144,378, Cl. 428-653.000.

Kimeda, Tsuneji: *See—*
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Kimura, Ryuichi: *See—*
Shikinami, Yasuo; Kimura, Ryuichi; Yoshikawa, Yoshinobu; Iida, Kosuke; and Hata, Kunihiro, 4,144,153, Cl. 204-159.200.

Kimura, Yoshiaki; Takeuchi, Yoshio; Yamada, Mikio; Morishita, Taneji; and Yajima, Tatsuo, to Konishiroku Photo Industry Co., Ltd. Method and apparatus for capping a nozzle of ink jet recording device. 4,144,537, Cl. 346-140.00R.

Kincel, Roger S.: *See—*
Burdorf, Donald L.; Bjordahl, James; Kincel, Roger S.; and Arns, Harold E., 4,144,549, Cl. 360-78.000.

King Industries, Inc.: *See—*
Gallacher, Lawrence V., 4,144,377, Cl. 428-458.000.

King, William R. Brake control apparatus for railway cars. 4,143,923, Cl. 303-22.00R.
Kingston, William. Fish bait dispenser. 4,143,479, Cl. 43-44.990.
Kinkade, Charles E.; Morgner, Robert O.; and Sharp, Harold L., to General Motors Corporation. Transmission shift control. 4,143,560, Cl. 74-473.00R.
Kinney, Robert E.: *See*—
Anderson, James J.; Camacho, Vasco G.; Kinney, Robert E.; and Seger, Francis M., 4,144,387, Cl. 521-174.000.
Kinzer, William K.; and Kusner, Robert E., to Republic Steel Corporation. Processes for blast furnace operations. 4,144,053, Cl. 75-42.000.
Kirchweger, Karl; Foidl, Helmut; List, Hans; and Greier, Josef, to List, Hans. Instant fastener for the releasable fixing of a removable housing part. 4,143,895, Cl. 292-223.000.
Kirkbride, Chalmer G. Process for regenerating spent cracking catalyst. 4,144,189, Cl. 252-414.000.
Kishi, Iwao: *See*—
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Kishimoto, Jyuji: *See*—
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Kitagawa, Junji: *See*—
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Kitagawa, Norihisa; and White, Lionel S., Jr., to Texas Instruments Incorporated. Intermediate output buffer circuit for semiconductor memory device. 4,144,590, Cl. 365-205.000.
Kitamura, Shigeyoshi: *See*—
Masuko, Fujio; Fujiyoshi, Kazuhiko; Ume, Yoshitaka; Nakai, Shinji; Kitamura, Shigeyoshi; and Umemura, Takeaki, 4,144,264, Cl. 260-465.00G.
Kitamura, Shuji: *See*—
Mori, Atsuo; Okita, Taisuke; Kitamura, Shuji; Kotani, Kozo; and Hama, Masaaki, 4,144,113, Cl. 156-334.000.
Kitchens, Judith A. F., to Atlantic Research Corporation. Dehalogenation of halogenated compounds. 4,144,152, Cl. 204-158.00R.
Kitsnik, Henrik M., to AB Kalle-Regulatorer. Pressure regulator. 4,143,673, Cl. 137-115.000.
Klaus, Helmuth; Fass, Carl; and Lause, Heinz, to Intertrac Viehmann & Co. Bumper for track suspension of a tracklaying vehicle. 4,143,898, Cl. 293-137.000.
Klavitter, George. Typewriter word counter. 4,143,808, Cl. 235-102.000.
Klement, Matyas: *See*—
Noack, Christian; Oliva, Klaus; Eistert, Theodor; Zumpf, Bernd; Spaida, Hans P.; John, Gunter; Pietschmann, Frank; Boltizar, Pal; Fabry, Istvan; Vida, Csongor; Lakos, Lajos; and Klement, Matyas, 4,143,504, Cl. 56-98.000.
Klenk, Herbert; Lussling, Theodor; Maierhofer, Alfred; Offermanns, Heribert; and Wagner, Hans, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of benzoyl cyanide (IV). 4,144,269, Cl. 260-545.00R.
Klich, Susanne M. Safety harness. 4,143,914, Cl. 297-389.000.
Klinge Pharma GmbH & Co.: *See*—
Grill, Helmut; Zschocke, Rainer H.; Wagner, Josef; Hofrichter, Gernot; and Janiak, P. Stefan, 4,144,351, Cl. 424-278.000.
Klingler, Karl H.: *See*—
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Klotzner, Winfried; Daumer, Rolf; Busse, Wolfgang; and du Mont, Hans-Christoph, to Robert Bosch GmbH. Fuel injection apparatus for internal combustion engines. 4,143,622, Cl. 123-32.0EC.
Klug, Herbert H.; and Staszak, Albert P., to Litton Systems, Inc. Power supply with replaceable high-voltage bushing. 4,144,402, Cl. 174-52.0PE.
Knackstedt, Wilhelm: *See*—
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Knight, Derek I.: *See*—
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Knight, Houston W., to FMC Corporation. Torsionally controlled swivel joint. 4,143,675, Cl. 137-615.000.
Knoke, Jurgen; Stegmann, Gerhard; Tecl, Bohuslav; and Fahrbach, Erich, to Carl Freudenberg, Firma. Combined interlining and chest piece for garments. 4,143,424, Cl. 2-255.000.
Knoll, Jozsef: *See*—
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Kobayashi, Masayoshi, to Diesel Kiki Company, Ltd. Fuel injection timing control device. 4,143,632, Cl. 123-139.0AQ.
Kobayashi, Osamu, to Nissan Motor Company, Limited. Rubbing contact fluid seal. 4,143,882, Cl. 277-96.200.
Kobayashi, Tamotsu, to Hokushin Electric Works, Ltd. Resistance-to-current converter. 4,143,550, Cl. 73-362.0AR.
Kobayashi, Yoshimitsu: *See*—
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Kobe Steel, Ltd.: *See*—
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Koch, Karlheinz; and Kroke, Hermann, to Henkel Kommanditgesellschaft auf Aktien. Mixed branched and straight chain ester oils. 4,144,183, Cl. 252-56.00S.
Kodama, Akihiko: *See*—
Nakazono, Jiro; Kodama, Akihiko; and Tsuchiya, Yukio, 4,143,738, Cl. 181-159.000.
Kodama, Kenichiro: *See*—
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Kodama, Tadashi; Murakami, Masayuki; Kimeda, Tsuneji; Matsuoka, Tadahiko; Hara, Osamu; and Tsukiyama, Satoru, to Iwasaki Tsushinki Kabushiki Kaisha; and Nippon Telegraph and Telephone Public Corporation. Rotary telephone dial. 4,144,413, Cl. 179-90.00R.
Koehler, Richard L., to United States of America, Navy. Temperature measuring system. 4,143,549, Cl. 73-342.000.
Koehring Company: *See*—
Wallenfang, Jerome A., 4,143,757, Cl. 198-494.000.
Koenig, Horst: *See*—
Boell, Walter; and Koenig, Horst, 4,144,239, Cl. 546-301.000.
Koenig, Myron, to M. Argueso & Co., Inc. Wax composition for investment casting and casting method. 4,144,075, Cl. 106-38.800.
Koga, Toshio, to Nippon Electric Co., Ltd. Predictive codec capable of selecting one of at least three prediction signals in two steps. 4,144,543, Cl. 358-136.000.
Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
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Kollmorgen Technologies Corporation: *See*—
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Kolm, Henry H., to Sala Magnetics, Inc. Magnetodensity separation method and apparatus. 4,144,163, Cl. 209-12.000.
Komatsu, Akira: *See*—
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Konishi, Masami; Futamura, Kazumasa; Noda, Takashi; and Morikawa, Nobutaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Heat insulator support in manifold reactor. 4,143,513, Cl. 60-282.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
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Koppel, Gary A.; and Cooper, Robin D. G., to Eli Lilly and Company. Substituted azetidin-2-one antibiotics. 4,144,232, Cl. 260-239.00A.
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Kotani, Kozo: *See*—
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Kowalik, Peter M.; and Milianowicz, Stanislaw A., to Westinghouse Electric Corp. Single barrel puffer circuit interrupter with downstream gas coolers. 4,144,426, Cl. 200-148.00A.
Koyama, Mitsuo: *See*—
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Sieron, Richard L.; Kozek, Edward P.; and Shine, William P., 4,144,462, Cl. 307-66.000.
Kraft Foods Ltd.: *See*—
Weiss, Donald E.; Dixon, David R.; and West, Simon M., 4,144,373, Cl. 428-306.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Maritsch, Franz, 4,144,125, Cl. 176-38.000.
Kraizinger, Fedor V.: *See*—
Nemtsov, Nikolai S.; Vasiliev, Viktor I.; Tarasov, Vladimir P.; Pliskanovsky, Stanislav T.; Shokul, Anatoly A.; Kravchenko, Anatoly P.; Kraizinger, Fedor V.; and Krjukov, Ivan I., 4,143,777, Cl. 414-170.000.
Krajeweski, Siegfried: *See*—
Graewe, Eberhard; and Krajeweski, Siegfried, 4,143,548, Cl. 73-181.000.
Kralik, Andrew J.: *See*—
Gryctko, Carl E.; and Kralik, Andrew J., 4,144,427, Cl. 200-153.00G.
Kramer, Erich, to Schlappig, Manfred. Adjustable hinge joint. 4,143,912, Cl. 297-362.000.
Kramer, Ruth, administratrix: *See*—
Krammer, Robert, deceased, 4,143,599, Cl. 104-172.00S.
Krammer, Robert, deceased (by Kramer, Ruth, administratrix), to A-T-O Inc. Power and free trolley apparatus. 4,143,599, Cl. 104-172.00S.
Krause, Daniel V.: *See*—
Kerr, Charles, III; and Krause, Daniel V., 4,144,557, Cl. 362-84.000.

Krause, Walter O., to Parker-Hannifin Corporation. Filter block and method of making the same. 4,144,171, Cl. 210-496.000.

Kravchenko, Anatoly P.: *See*—
Nemtsov, Nikolai S.; Vasiliev, Viktor I.; Tarasov, Vladimir P.; Pliskanovsky, Stanislav T.; Shokul, Anatoly A.; Kravchenko, Anatoly P.; Kraizinger, Fedor V.; and Krjukov, Ivan I., 4,143,777, Cl. 414-170.000.

Kreft, Gunter. Self-centering basket. 4,143,713, Cl. 166-241.000.

Krepler, Albert, to Ruthner Industrieanlagen-Aktiengesellschaft. Process for regenerating a nitric acid-hydrofluoric acid pickling solution. 4,144,092, Cl. 134-12.000.

Krieg, Adrian H., to Widder Corporation. Apparatus for cutting pipes, plates and the like. 4,143,862, Cl. 266-56.000.

Krings, Peter: *See*—
Reinwald, Elmar; Schwuger, Milan J.; Smolka, Heinz; and Krings, Peter, 4,144,093, Cl. 134-13.000.

Krjukov, Ivan I.: *See*—
Nemtsov, Nikolai S.; Vasiliev, Viktor I.; Tarasov, Vladimir P.; Pliskanovsky, Stanislav T.; Shokul, Anatoly A.; Kravchenko, Anatoly P.; Kraizinger, Fedor V.; and Krjukov, Ivan I., 4,143,777, Cl. 414-170.000.

Kroke, Hermann: *See*—
Koch, Karlheinz; and Kroke, Hermann, 4,144,183, Cl. 252-56.00S.

Kroll, Rudolf: *See*—
Heitland, Herbert; Kroll, Rudolf; and Grundmann, Edgard, 4,143,644, Cl. 126-271.000.

Kroner, Karl-Heinz: *See*—
Kula, Maria-Regina; Kroner, Karl-Heinz; Stach, Wolfgang; Hustedt, Helmut; Durekovic, Andija; and Grandja, Stefica, 4,144,130, Cl. 195-66.00R.

Kruesi, Paul R., to Cato Research Corp. Process for recovering nickel, cobalt and manganese from their oxide and silicate ores. 4,144,056, Cl. 75-111.000.

Kubo, Keizi: *See*—
Kudo, Teizo; Furukawa, Shoji; and Kubo, Keizi, 4,144,287, Cl. 260-876.00R.

Kubota, Kazuo: *See*—
Otouma, Takashi; Asaumi, Hiroshi; Kubota, Kazuo; and Yamamoto, Mitsuo, 4,144,121, Cl. 162-145.000.

Kubota Ltd.: *See*—
Itani, Seiichi, 4,143,724, Cl. 177-25.000.

Kubota, Toshifumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Small retro-focus wide angle photographic lens system. 4,143,945, Cl. 350-214.000.

Kuda, Vladimir; and Bucek, Miroslav, to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstyl. Apparatus for distributing pressurized fluid to a multi-element weft inserter. 4,143,681, Cl. 139-435.000.

Kudo, Shiro; Ishino, Keizo; and Akaba, Kunihisa, to Asahimatsu Koridofu Kabushiki Kaisha. Preparation of a cheese food. 4,144,358, Cl. 426-582.000.

Kudo, Teizo; Furukawa, Shoji; and Kubo, Keizi, to Daicel Ltd. Impact-resistant resin composition. 4,144,287, Cl. 260-876.00R.

Kuest, Elsie: *See*—
Kuest, Johnnie; and Kuest, Elsie, 4,143,592, Cl. 99-483.000.

Kuest, Johnnie; and Kuest, Elsie. Apparatus for food dehydration and raising bakery products doughs. 4,143,592, Cl. 99-483.000.

Kuesters, Werner; Jacobi, Manfred; and Osterloh, Rolf, to BASF Aktiengesellschaft. Manufacture of unsymmetric monoacetals of aromatic 1,2-diketones employable as photoiniatiators. 4,144,156, Cl. 204-159.230.

Kuhn, Hans H.: *See*—
Hauser, Peter J.; Hendrix, James E.; and Kuhn, Hans H., 4,144,028, Cl. 8-164.000.

Kuhnis, Hans: *See*—
Eichenberger, Kurt; Kuhnis, Hans; Ostermayer, Franz; and Schroter, Herbert, 4,144,344, Cl. 424-267.000.

Kula, Maria-Regina; Kroner, Karl-Heinz; Stach, Wolfgang; Hustedt, Helmut; Durekovic, Andija; and Grandja, Stefica, to Gesellschaft fur Biotechnologische Forschung. Process for the separation of enzymes. 4,144,130, Cl. 195-66.00R.

Kulbakh, Valter O.: *See*—
Vainshtein, Viktor A.; Kulbakh, Valter O.; Etingov, Evgeny D.; Naumchik, Grigory N.; Ekzemplyarov, Oleg N.; Mikhailets, Georgy A.; Grinberg, Grigory E.; and Egorenkova, Alla N., 4,144,328, Cl. 424-180.000.

Kulke, Gunter, to Robert Bosch GmbH. Injection valve for internal combustion engines. 4,143,625, Cl. 123-32.00R.

Kulsa, Peter: *See*—
Mrozik, Helmut H.; and Kulsa, Peter, 4,144,345, Cl. 424-272.000.

Kumobayashi, Hidenori; Akutagawa, Susumu; and Komatsu, Akira, to Takasago Perfumery Co., Ltd. Process for preparing derivatives of conjugated diene dimers. 4,144,257, Cl. 260-410.90R.

Kung, Harold H. C.: *See*—
Jarrett, Howard S.; Kung, Harold H. C.; and Sleight, Arthur W., 4,144,147, Cl. 204-129.000.

Kunita, Masao: *See*—
Kurihara, Tohio; Mizutani, Nagao; Okawara, Yasuo; Nojima, Masamitsu; and Kunita, Masao, 4,143,977, Cl. 400-56.000.

Kurihara, Tohio; Mizutani, Nagao; Okawara, Yasuo; Nojima, Masamitsu; and Kunita, Masao. Print station apparatus. 4,143,977, Cl. 400-56.000.

Kuroha, Kenji: *See*—
Ito, Yasuro; Kaga, Hideharu; Yamamoto, Yasuhiro; Sumita, Tadayuki; Suzuki, Kuniomi; Kuroha, Kenji; Ishii, Takakazu; and Hayakawa, Mitsutaka, 4,143,541, Cl. 73-55.000.

Kurtz, Clark N., to Eastman Kodak Company. Electrographic imaging apparatus and method. 4,143,962, Cl. 355-10.000.

Kusner, Robert E.: *See*—
Kinzer, William K.; and Kusner, Robert E., 4,144,053, Cl. 75-42.000.

Kutney, James P., to United States of America, Health, Education and Welfare. Synthetic vinblastine and vincristine derivatives. 4,144,237, Cl. 260-244.400.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Unno, Naoyuki; Yoshino, Mutsuyuki; and Murata, Minoru, 4,144,354, Cl. 426-2.000.

L' Oreal: *See*—
Goncalves, Antonin, 4,143,431, Cl. 4-231.000.

Laciak, Francis M.; and Strunc, Gerald R., to Pako Corporation. Semi-automatic strip feed control. 4,143,566, Cl. 83-42.000.

LaForge, David H.; and Portner, Peer M., to Andros Incorporated. Power supply for body implant and method for operation. 4,143,661, Cl. 128-419.00R.

Lagow, Richard J.; Adcock, James L.; and Inoue, Shoji, to Massachusetts Institute of Technology. Perfluorinated functionalized materials. 4,144,374, Cl. 428-334.000.

LaHaye, Paul G.; Bjerklie, John W.; and Gallant, Gerald G., Jr., to Hague International. Energy conserving process furnace system and components thereof. 4,144,020, Cl. 432-19.000.

Lahos, Etienne. Bicycle wheel alignment indicating instrument. 4,143,464, Cl. 33-203.160.

Laimer, Friedrich; and Herrmann, Herbert, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Hood arranged on a blowing stand comprising a tiltable converter. 4,143,864, Cl. 266-158.000.

Lakos, Lajos: *See*—
Noack, Christian; Oliva, Klaus; Eistert, Theodor; Zumpf, Bernd; Spaida, Hans P.; John, Gunter; Pietschmann, Frank; Boltizar, Pal; Fabry, Istvan; Vida, Csongor; Lakos, Lajos; and Klement, Matyas, 4,143,504, Cl. 56-98.000.

Laktjushin, Alexandr N.: *See*—
Dementiev, Valentin V.; Zhidovich, Anatoly I.; Mosse, Alfred L.; Yasko, Oleg I.; Polak, Lev S.; Gulyaev, Genrikh V.; Levenzon, Rafail I.; Volodin, Nikolai L.; Vurzel, Filipp B.; and Laktjushin, Alexandr N., 4,144,444, Cl. 219-383.000.

Lala, Robert J., to Lever Brothers Company. Reduced-staining colorant system. 4,144,024, Cl. 8-25.000.

Lamb, Sydney M., to Semionics Associates. Associative memory. 4,144,564, Cl. 364-200.000.

Lambert, Ronald F.; and Schreiber, Karl J., to Polaroid Corporation. Polysilicates in photographic products and processes. 4,144,065, Cl. 96-29.00D.

Lamberti, Vincent, to Lever Brothers Company. Novel anticalculus compositions. 4,144,323, Cl. 424-54.000.

Lambiotte, Joseph C.: *See*—
Davie, Neil R.; and Lambiotte, Joseph C., 4,144,539, Cl. 346-160.000.

LaMore, Herbert T.: *See*—
Witt, James L.; and LaMore, Herbert T., 4,144,292, Cl. 261-39.00B.

Lamperti, Enrico. Coil unwinder. 4,143,826, Cl. 242-54.00R.

Land, Geoffrey A.: *See*—
Dorn, Gordon L.; and Land, Geoffrey A., 4,144,133, Cl. 195-100.000.

Landrum, Harlie L.: *See*—
Hawkridge, Fredrick M.; and Landrum, Harlie L., 4,144,143, Cl. 204-72.000.

Landucci, Dennis P., to Minnesota Mining and Manufacturing Company. Carpet-treating compositions. 4,144,367, Cl. 428-96.000.

Landwehrkamp, Hans: *See*—
Lovas, Kurt; and Landwehrkamp, Hans, 4,143,825, Cl. 242-18.0PW.

Lane, Richard: *See*—
Glatt, Jack E.; Detzel, Jacob J.; and Lane, Richard, 4,144,303, Cl. 264-138.000.

Lang, Gunter: *See*—
Gruber, Wolfgang; Bergmeyer, Hans U.; Nelbock-Hochstetter, Michael; Beaucamp, Klaus; Holz, Gunter; Gramsall, Johanna; and Lang, Gunter, 4,144,129, Cl. 195-66.00R.

Lange, Bernd, to Borsig Gesellschaft mit beschrankter Haftung. Gas-oil drive for forward and reverse mechanical adjusting movements. 4,143,851, Cl. 251-29.000.

Langenbach, Jack E.: *See*—
Goodman, David S.; Curley, James H.; and Langenbach, Jack E., 4,143,935, Cl. 339-99.00R.

Langieri, Michael, Jr.; and De Graaff, Robert H. Coaster brake. 4,143,747, Cl. 192-89.00W.

Langston, Jimmy B.; Leeper, Harold; and Wong, Patrick S., to Alza Corporation. Device for dispensing microcide formed when device is in environment of use. 4,144,309, Cl. 422-305.000.

La Porte, Gerald E.; Osterkorn, Charles L.; and Marino, Salvatore M., to Fedders Corporation. Heat transfer fin structure. 4,143,710, Cl. 165-182.000.

Larkin, William A., to M&T Chemicals Inc. Method for coating glass using monoalkyltin trihalides. 4,144,362, Cl. 427-226.000.

Larson, Dale W. Eaves ladder grip. 4,143,743, Cl. 182-206.000.

Larson, Robert L., to Regis Belt Maintenance Corporation. Method and apparatus for repairing conveyor belts. 4,143,565, Cl. 83-4.000.

Laufenberg, Carol J.: *See*—
Custer, Milton F.; and Laufenberg, Carol J., 4,143,655, Cl. 128-90.000.

Lause, Heinz: *See—*
Klaus, Helmuth; Fass, Carl; and Lause, Heinz, 4,143,898, Cl. 293-137.000.

Lawson, Roger E.; and Richesson, Maurice A., to Digital Equipment Corporation. Secondary storage facility with means for monitoring error conditions. 4,144,583, Cl. 364-900.000.

Layden, Owen P.; and Murdoch, Francis J., to United States of America, Army. Mechanical acceleration multiplier for microcircuit bond testing. 4,143,543, Cl. 73-827.000.

Lee, Angel J., executor: *See—*
Stratford, Michael G.; and Lee, Ronald H. D. F., deceased, 4,143,794, Cl. 222-42.000.

Lee, David N.: *See—*
Cooper, Norman F.; and Lee, David N., 4,143,904, Cl. 296-57.00A.

Lee, James H.; Lessmann, Bernd K. S.; and Satya, Akella V., to International Business Machines Corporation. Integrated circuit test structure. 4,144,493, Cl. 324-158.00R.

Lee, Ronald H. D. F., deceased: *See—*
Stratford, Michael G.; and Lee, Ronald H. D. F., deceased, 4,143,794, Cl. 222-42.000.

Lee, Soo-Il, to Owens-Illinois, Inc. Method of forming strain crystallized thermoplastic articles. 4,144,298, Cl. 264-532.000.

Leeper, Harold: *See—*
Langston, Jimmy B.; Leeper, Harold; and Wong, Patrick S., 4,144,309, Cl. 422-305.000.

Legeza, Anatoly V.: *See—*
Khimenko, Lev T.; Mezhuev, Alexandr T.; Legeza, Anatoly V.; Sljusarev, Andrei K.; Gavrjuschenko, Anatoly D.; Chudakov, Vyacheslav A.; and Baranov, Mikhail I., 4,143,532, Cl. 72-56.000.

Leggett, Norman D.; and Epworth, Richard E., to International Standard Electric Corporation. Planar laser mount. 4,144,504, Cl. 331-94.50P.

Legoski, Paul L.: *See—*
Werthaiser, Martin S.; and Legoski, Paul L., 4,144,294, Cl. 264-15.000.

Lehnhert, Gunter, to General Motors Corporation. Signal generator for a fluid-level indicator. 4,144,521, Cl. 340-59.000.

Leiber, Heinz, to Robert Bosch GmbH. Master brake cylinder for two-circuit braking system. 4,143,514, Cl. 60-534.000.

Lelental, Mark; and Gysling, Henry J., to Eastman Kodak Company. Organotellurium (II) and (IV) compounds in heat-developable photographic materials and process. 4,144,062, Cl. 96-114.100.

Lenaerts, Duido J. J.: *See—*
Delen, Robert R. M.; and Lenaerts, Duido J. J., 4,144,475, Cl. 315-73.000.

Lenck, Wolfdieter: *See—*
Guse, Gunter; Lukat, Ernst; Jauchen, Peter; Lenck, Wolfdieter; and Pietsch, Hanns, 4,144,157, Cl. 204-159.230.

Lendvai, Imre: *See—*
Ivony, Jozsef; Lendvai, Imre; Szucs, Laszlo; and Szekely, Laszlo, 4,143,676, Cl. 137-625.230.

Lenius, Norbert W.; and Stearn, Richard A., to J. I. Case Company. Hoisting mechanism for straddle carrier spreader and straddle carrier steering system. 4,143,781, Cl. 414-460.000.

Lenz, Werner: *See—*
Bronstert, Bernd; Lenz, Werner; Hartmann, Heinrich; Werther, Heinz-Ulrich; and Zuerger, Manfred, 4,144,073, Cl. 96-115.00P.

Leo, Bruno S.; and Liu, Chang P., to United States of America, Navy. Impingement cooled deformable laser mirror. 4,143,946, Cl. 350-310.000.

L'Eplattenier, Francois; and Vuitel, Laurent, to Ciba-Geigy Corporation. 1:1-Heterocyclic azo methine-metal complex dyestuffs. 4,144,258, Cl. 542-418.000.

Lessmann, Bernd K. S.: *See—*
Lee, James H.; Lessmann, Bernd K. S.; and Satya, Akella V., 4,144,493, Cl. 324-158.00R.

Lettermann, Peter: *See—*
Schmude, Leonhard; Hasnay, Luan P.; Amende, Dieter V.; and Lettermann, Peter, 4,143,732, Cl. 180-68.00P.

Leutner, Bernd; Scizi, Gotthard; Lukas, Siegmar; Schreiner, Siegfried; and Voelkl, Erfried, to BASF Aktiengesellschaft. Continuous manufacture of sodium dithionite solutions by cathodic reduction. 4,144,146, Cl. 204-92.000.

Levenzon, Rafail I.: *See—*
Dementiev, Valentin V.; Zhidovich, Anatoly I.; Mosse, Alfred L.; Yasko, Oleg I.; Polak, Lev S.; Gulyaev, Genrikh V.; Levenzon, Rafail I.; Volodin, Nikolai L.; Vurzel, Filipp B.; and Laktjushin, Alexandr N., 4,144,444, Cl. 219-383.000.

Lever Brothers Company: *See—*
Lala, Robert J., 4,144,024, Cl. 8-25.000.
Lamberti, Vincent, 4,144,323, Cl. 424-54.000.
Winterbotham, Peter; and Hampson, Jeffrey D., 4,144,201, Cl. 252-547.000.

Levi Strauss & Company: *See—*
Blessing, Hubert, 4,143,871, Cl. 271-10.000.

Levy, Leonard R.: *See—*
Dutkewych, Oleh B.; Gaputis, Charles A.; Gulla, Michael; and Levy, Leonard R., 4,144,119, Cl. 156-659.000.

Levy, Marilyn; and Ball, Vincent W., to United States of America, Army. Reconnaissance/surveillance system utilizing color signature of target. 4,143,971, Cl. 356-404.000.

Lewis, Brian; and Deacon, John M., to Plessey Handel und Investments AG. Surface acoustic wave filters. 4,144,508, Cl. 333-191.000.

Lewis, Carl M.; and Ferguson, Peter D., to Trane Company, The. Air conditioning apparatus including a heat pump. 4,143,707, Cl. 165-28.000.

Lewis, John G.: *See—*
Gomberg, Henry J.; Lewis, John G.; Teichmann, Theodor; and Teitel, Robert J., 4,144,150, Cl. 204-157.10H.

Lewis, Robert D., to Armstrong Cork Company. Multi-colored pattern bonded fabric. 4,144,366, Cl. 428-88.000.

Lewmar Marine Limited: *See—*
Burton, John D.; and Huggett, Richard D. J., 4,143,855, Cl. 254-150.00R.

Ley, Gordon S., to United States of America, Air Force. Integrated quantized signal smoothing processor. 4,144,577, Cl. 364-571.000.

LGZ Landis & Gyr Zug AG: *See—*
Greenaway, David L., 4,143,810, Cl. 235-487.000.

Lhota, Thomas G.: *See—*
Sickinger, Albert E.; and Lhota, Thomas G., 4,143,686, Cl. 140-92.930.

Lieb, Manfred: *See—*
Mittnacht, Hans; Echte, Adolf; Jenne, Helmut; Lieb, Manfred; Bronstert, Klaus; and Adler, Hansjoerg, 4,144,204, Cl. 260-4.0AR.

Lieber, Hans-Wilhelm: *See—*
Kammel, Roland; and Lieber, Hans-Wilhelm, 4,144,148, Cl. 204-149.000.

Liepins, Sigurds; and Crane, James W., to Coleman Company, Inc., The. Gun with safety link for firing mechanism thereof. 4,143,636, Cl. 124-40.000.

Lill, Melvin H., to FMC Corporation. Wheel alignment method and apparatus. 4,143,970, Cl. 356-155.000.

Lindauer Dornier Gesellschaft mbH: *See—*
Lindenmuller, Walter; and Peter, Erich, 4,143,684, Cl. 139-450.000.

Lindenmuller, Walter; and Peter, Erich, to Lindauer Dornier Gesellschaft mbH. Process and apparatus for reed-beating and cutting off fillings inserted into the shed in shuttleless weaving machinery equipped with weft mixers. 4,143,684, Cl. 139-450.000.

Linder, Ernst: *See—*
Schnaibel, Eberhard; Junginger, Erich; Linder, Ernst; and Hertfelder, Wilhelm, 4,143,706, Cl. 165-26.000.

Linder, Seymour M.; and Calentine, John W., to Alcolac Inc. Air-curing copolymer latices. 4,144,212, Cl. 260-29.70H.

Lines, Kent K. Production of single-cell protein from potato processing waste. 4,144,132, Cl. 195-82.000.

Ling, Andrew T.: *See—*
Donohue, James M.; Ling, Andrew T.; Malinich, Richard M.; and Nelson, Frank M., 4,144,550, Cl. 364-107.000.

List, Hans: *See—*
Kirchweger, Karl; Foidl, Helmut; List, Hans; and Greier, Josef, 4,143,895, Cl. 292-223.000.

L'Italien, Yvon J., to Parke, Davis & Company. Pyrrolidineacetic acid esters. 4,144,246, Cl. 260-326.430.

Litkei, Laszlo: *See—*
Bognar, Reszo; Makleit, Sandor; Kiss, Geza; Berenyi, Sandor; Mile, Terez; Knoll, Jozsef; Elek, Sandor; Gyoker, Istvan; Zoltai, Attila; Toth, Gyorgy; and Litkei, Laszlo, 4,144,236, Cl. 546-46.000.

Litton Systems, Inc.: *See—*
Craig, Robert J. G.; Council, Clifton T.; and Jansen, Jack F., 4,143,451, Cl. 29-434.000.
Ehlers, Bruce W., 4,144,437, Cl. 219-10.55F.
Klug, Herbert H.; and Staszak, Albert P., 4,144,402, Cl. 174-52.0PE.
McCammon, John W.; and Imokawa, George, 4,144,506, Cl. 333-26.000.
Wiener, Robert P., 4,143,546, Cl. 73-151.000.

Liu, Chain T.; and Inouye, Henry, to United States of America, Energy. Ductile long range ordered alloys with high critical ordering temperature and wrought articles fabricated therefrom. 4,144,059, Cl. 75-170.000.

Liu, Chang P.: *See—*
Leo, Bruno S.; and Liu, Chang P., 4,143,946, Cl. 350-310.000.

Liu, Chia-Seng: *See—*
Kim, Charles W.; and Liu, Chia-Seng, 4,144,368, Cl. 428-105.000.

Liu, Kang-Jen: *See—*
Nagasubramanian, Krishnamurthy; Chlanda, Frederick P.; and Liu, Kang-Jen, 4,144,158, Cl. 204-180.00P.

Lockhart, Scott N.: *See—*
Brooks, Joseph F.; Hohulin, Samuel E.; and Lockhart, Scott N., 4,143,441, Cl. 15-369.000.

Lodige, Fritz: *See—*
Lodige, Wilhelm; Lodige, Fritz; Lucke, Josef; and Schluter, Wilhelm, 4,143,975, Cl. 366-147.000.

Lodige, Wilhelm; Lodige, Fritz; Lucke, Josef; and Schluter, Wilhelm. Apparatus for applying adhesive to fibrous material. 4,143,975, Cl. 366-147.000.

Loechel, Stephen J. Educational toy. 4,143,481, Cl. 46-26.000.

Logrando, John C.: *See—*
Smith, David W.; and Logrando, John C., 4,144,551, Cl. 361-93.000.

Long, Aden B. Air-water power generator. 4,143,516, Cl. 60-649.000.

Long, E. David, to Allied Chemical Corporation. Fuel injection system with augmented temperature sensitive fuel enrichment for transient engine loads. 4,143,621, Cl. 123-32.0EG.

Longo, Joseph F., to Condor International Corporation. Material handling bucket arrangement. 4,143,900, Cl. 294-70.000.

Lonza, Ltd.: *See—*
Said, Adel, 4,144,238, Cl. 546-318.000.

Loree, Thomas R.; and Barker, Dean L., to United States of America,

Energy. Device and method for noresonantly Raman shifting ultraviolet radiation. 4,144,464, Cl. 307-88.300.

Lovas, Kurt; and Landwehrkamp, Hans, to Schubert & Salzer. Method and apparatus for picking up a yarn and transferring it to a pirn after a bobbin change. 4,143,825, Cl. 242-18.0PW.

Lowery, A. J. Hand reel. 4,143,746, Cl. 191-12.400.

Luber, Paul, to Sulzer Brothers Ltd. Fabric having a reinforced warp strip and a process for producing the same. 4,143,679, Cl. 139-383.00R.

Luc, Jane. Dynamic friction bonding process. 4,144,110, Cl. 156-73.500.

Lucas Industries Limited: *See—*
Hollett, Reginald; and Skinner, Robert T. J., 4,144,000, Cl. 417-462.000.
Thornley, Derek, 4,144,483, Cl. 320-25.000.

Lucke, Josef: *See—*
Lodige, Wilhelm; Lodige, Fritz; Lucke, Josef; and Schluter, Wilhelm, 4,143,975, Cl. 366-147.000.

Ludoph, Hemmo H. J.: *See—*
van Deursen, Petrus H.; and Ludoph, Hemmo H. J., 4,143,558, Cl. 74-230.17F.

Lueders, Robert E.: *See—*
Frankiewicz, Theodore C.; and Lueders, Robert E., 4,144,310, Cl. 423-27.000.

Luedicke, Oscar B., Jr.; and Gichia, Francis M., to American Cyanamid Company. Oil free, water-soluble, clear creme rinse for hair. 4,144,326, Cl. 424-70.000.

Luhm, Ralph R., to Allfast, Inc. Lock spindle blind rivet. 4,143,580, Cl. 85-77.000.

LuK Lamellen und Kupplungsbau GmbH: *See—*
Maucher, Paul, 4,143,748, Cl. 192-98.000.

Lukacs, George J.: *See—*
Drelich, Arthur H.; and Lukacs, George J., 4,144,209, Cl. 260-29.20M.

Lukas, Siegmar: *See—*
Leutner, Bernd; Scizi, Gotthard; Lukas, Siegmar; Schreiner, Siegfried; and Voelkl, Erfried, 4,144,146, Cl. 204-92.000.

Lukat, Ernst: *See—*
Guse, Gunter; Lukat, Ernst; Jauchen, Peter; Lenck, Wolfdieter; and Pietsch, Hanns, 4,144,157, Cl. 204-159.230.

Lupis, Claude H. P. Desulfurization of fluorite ores. 4,144,312, Cl. 423-178.000.

Lussling, Theodor: *See—*
Klenk, Herbert; Lussling, Theodor; Maierhofer, Alfred; Offermanns, Heribert; and Wagner, Hans, 4,144,269, Cl. 260-545.00R.

Lutz, Ronald E.; Sokol, Henry R.; and Sorwick, Jack R., to Picker Corporation. X-ray table lockout apparatus and method. 4,144,455, Cl. 250-444.000.

Lyshkow, Norman A.; Beningson, Herbert E.; and Di Ruocco, Camillo V., to Combustion Equipment Associates, Inc. Vortex type burner. 4,144,019, Cl. 431-173.000.

M. Argueso & Co., Inc.: *See—*
Koenig, Myron, 4,144,075, Cl. 106-38.800.

M&T Chemicals Inc.: *See—*
Larkin, William A., 4,144,362, Cl. 427-226.000.

Maag Gear-Wheel & Machine Co. Ltd.: *See—*
Mesey, Milton M., 4,143,637, Cl. 125-11.0CC.

Maan, Shivcharan S., to Research Corporation. Hybrid wheat. 4,143,486, Cl. 47-58.000.

MacDonald, Kelvyn I. Tire patching kit. 4,143,767, Cl. 206-582.000.

Machida, Takayasu: *See—*
Nakajima, Fumio; Nikaido, Akira; Onda, Mitsuo; Machida, Takayasu; and Toida, Takashi, 4,144,467, Cl. 310-49.00R.

Machinefabriek "Finis" B.V.: *See—*
van Raay, Albertus, 4,143,593, Cl. 99-631.000.

MacIver, Bernard A.; and Greenstein, Eugene, to General Motors Corporation. Method of low dose phoshorus implantation for oxide passivated diodes in <100> P-type silicon. 4,144,100, Cl. 148-1.500.

MacLean-Fogg Company: *See—*
Hlinsky, Emil J., 4,143,600, Cl. 105-477.000.

Maeda, Masaya: *See—*
Suzaki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takahashi, Kiyoshi; and Takimoto, Hiroyuki, 4,143,951, Cl. 352-169.000.

Mager, George E.: *See—*
Tu, George K.; Baker, Lamar T.; Markle, Robert E.; and Mager, George E., 4,144,561, Cl. 364-200.000.

Mages, Bernhard: *See—*
Rock, Erich; and Mages, Bernhard, 4,143,846, Cl. 248-360.000.

Magirus-Deutz Aktiengesellschaft: *See—*
Schmude, Leonhard; Hasnay, Luan P.; Amende, Dieter V.; and Lettermann, Peter, 4,143,732, Cl. 180-68.00P.

Magne, Frank C.: *See—*
Mod, Robert R.; Harris, James A.; Arthur, Jett C., Jr.; Magne, Frank C.; Sumrell, Gene; and Novak, Arthur F., 4,144,256, Cl. 260-402.500.

Maguire, Edward J., Jr.: *See—*
Gelman, Stephanie S.; Maguire, Edward J., Jr.; and Guilloty, Haydee R., 4,144,438, Cl. 219-10.55E.

Mahan, John E.: *See—*
Fahey, Darryl R.; and Mahan, John E., 4,144,259, Cl. 260-439.00R.

Mahosky, Barry A. Tractor trailer lift rails. 4,143,885, Cl. 280-477.000.

Maierhofer, Alfred: *See—*
Klenk, Herbert; Lussling, Theodor; Maierhofer, Alfred; Offermanns, Heribert; and Wagner, Hans, 4,144,269, Cl. 260-545.00R.

Main, John A.; and Trevarrow, David, to Kelsey-Hayes Co. Wheel forming machine. 4,143,449, Cl. 29-159.100.

Major, Harry. Accumulating roll conveyor. 4,143,525, Cl. 64-30.00D.

Makleit, Sandor: *See—*
Bognar, Reszo; Makleit, Sandor; Kiss, Geza; Berenyi, Sandor; Mile, Terez; Knoll, Jozsef; Elek, Sandor; Gyoker, Istvan; Zoltai, Attila; Toth, Gyorgy; and Litkei, Laszlo, 4,144,236, Cl. 546-46.000.

Makuuchi, Keizo: *See—*
Araki, Kunio; Makuuchi, Keizo; Takagi, Tohru; and Nakayama, Hiroyuki, 4,144,155, Cl. 204-159.220.

Malewicki, Douglas J.: *See—*
Goldberg, Allan M.; and Malewicki, Douglas J., 4,143,786, Cl. 215-274.000.

Malinich, Richard M.: *See—*
Donohue, James M.; Ling, Andrew T.; Malinich, Richard M.; and Nelson, Frank M., 4,144,550, Cl. 364-107.000.

Malinowski, William J., to Chloride Incorporated. Smoke detector with test means for simulating a predetermined percentage of smoke. 4,144,459, Cl. 250-574.000.

Mallow, William A.: *See—*
Hall, C. William; Mallow, William A.; and Hoese, Fred O., 4,143,426, Cl. 3-6.000.

Malloy, John F., to Norton Company. Polyurethane adhesive composition and use thereof. 4,144,219, Cl. 260-33.8UB.

Malyshev, Boris N.; Saljuk, Viktor A.; Skobelkin, Oleg K.; Toschakov, Robert A.; Brekhov, Evgeny I.; Egorov, Evgeny I.; and Ivanov, Alexei I. Method of surgery making use of laser emission and an apparatus for accomplishing same. 4,143,660, Cl. 128-303.100.

Mancuso, Anthony: *See—*
Ehrens, Henry; Slocum, Charles W.; Mancuso, Anthony; and Weiner, Sidney, 4,143,843, Cl. 248-544.000.

Manitowoc Company, Inc., The: *See—*
Morrow, James G., Sr., 4,143,856, Cl. 254-185.00R.

Mannesmann Aktiengesellschaft: *See—*
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Schrewe, Hans; and Pleschiutschnigg, Fritz-Peter, 4,143,866, Cl. 266-216.000.

Mapes, Stuart N.: *See—*
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Marathon Manufacturing Company: *See—*
Marotto, Anthony F., 4,143,699, Cl. 160-176.00R.

Marathon Oil Company: *See—*
Plummer, Mark A.; and Schroeder, Donald E., Jr., 4,144,266, Cl. 260-505.00S.

Marconi Instruments Limited: *See—*
Clarke, Graham J., 4,144,481, Cl. 318-331.000.

Marconi, Joseph. Die holder for punch presses. 4,143,569, Cl. 83-160.000.

Marer, Joseph G., to Redon Trust. Non-magnetic anti-personnel war mine. 4,143,598, Cl. 102-8.000.

Marino, Salvatore M.: *See—*
La Porte, Gerald E.; Osterkorn, Charles L.; and Marino, Salvatore M., 4,143,710, Cl. 165-182.000.

Maritsch, Franz, to Kraftwerk Union Aktiengesellschaft. Rupture protection device for hollow cylindrical members such as pipes, and particularly for pipes of nuclear reactors carrying primary coolant. 4,144,125, Cl. 176-38.000.

Marjollet, Jacques; Palacio, Gerard; and Tondeur, Gerard, to Stein Industrie S.A. Heat exchanger for superheating steam. 4,143,619, Cl. 122-483.000.

Market Forge, a division of Beatrice Foods Co.: *See—*
Spear, Harry W.; and Coppola, Peter J., 4,143,927, Cl. 312-196.000.

Markle, Robert E.: *See—*
Tu, George K.; Baker, Lamar T.; Markle, Robert E.; and Mager, George E., 4,144,561, Cl. 364-200.000.

Markovits, Gary: *See—*
Edmonds, Harold D.; and Markovits, Gary, 4,144,099, Cl. 148-1.500.

Markson, Kenneth J.: *See—*
Fossum, Bryce G.; Markson, Kenneth J.; Schloss, Phillip C.; and Wing, James W., 4,144,447, Cl. 235-92.0PE.

Markusch, Peter: *See—*
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Marotto, Anthony F., to Marathon Manufacturing Company. Venetian blind tilt limiter. 4,143,699, Cl. 160-176.00R.

Marshall, David M.: *See—*
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Mart Corporation, The: *See—*
Minkin, Gary E., 4,143,669, Cl. 134-153.000.

Martens, George D.; and Hendricks, T. B., to Automation Industries, Inc. Contoured search unit for detecting internal flaws. 4,143,553, Cl. 73-625.000.

Martin Automatic, Inc.: *See—*
Martin, John R., 4,143,829, Cl. 242-68.200.

Martin, Johannes J.; Martin, Walter J.; and Kammholz, Horst, to Josef Martin Feuerungsbau GmbH. Method and furnace for combustion of primary fuels with moisture containing secondary fuels. 4,143,603, Cl. 110-222.000.

Martin, John R., to Martin Automatic, Inc. Core chuck. 4,143,829, Cl. 242-68.200.

Martin, Mulford, Jr.; and Richter, Donald W., to Armco Steel Corporation. Concealed fastener clip for building panels. 4,143,498, Cl. 52-489.000.

Martin, Walter J.: *See*—
Martin, Johannes J.; Martin, Walter J.; and Kammholz, Horst, 4,143,603, Cl. 110-222.000.

Martin Yale Industries, Inc.: *See*—
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Maruo, Masatsuyo: *See*—
Takahata, Kei; Murasawa, Sadao; and Maruo, Masatsuyo, 4,144,184, Cl. 252-62.10L.

Marvin Glass & Associates: *See*—
Meyer, Burton C.; Nix, Donald F.; and Katzman, Allison W., 4,143,482, Cl. 46-43.000.

Masaie, Kimio: *See*—
Togawa, Kazuya; and Masaie, Kimio, 4,144,501, Cl. 329-118.000.

Maschek, Max; Capaul, Marcel; and Griehl, Wolfgang, to Inventa AG Fur Forschung und Patent-verwertung, Zurich. Process for producing hydrolysis-stable shaped structures of polyester. 4,144,285, Cl. 260-873.000.

Maslov, Valentin T.: *See*—
Antonov, Oleg K.; Maslov, Valentin T.; and Voitko, Alexei F., 4,143,839, Cl. 244-76.00R.

Massachusetts Institute of Technology: *See*—
Lagow, Richard J.; Adcock, James L.; and Inoue, Shoji, 4,144,374, Cl. 428-334.000.
Pierce, Norton T., 4,143,640, Cl. 126-270.000.

Masuda, Isamu. Mattress having a corrugated plate. 4,143,435, Cl. 5-345.00R.

Masuda, Takao: *See*—
Ikenoue, Shinpei; Masuda, Takao; and Sekikawa, Nobuyoshi, 4,144,072, Cl. 96-114.100.

Masuko, Fujio; Fujiyoshi, Kazuhiko; Ume, Yoshitaka; Nakai, Shinji; Kitamura, Shigeyoshi; and Umemura, Takeaki, to Sumitomo Chemical Company, Limited. Process for producing a 3-methyl-2-(4-halophenyl)butyronitrile. 4,144,264, Cl. 260-465.00G.

Mathbirk, Limited: *See*—
Matthews, Denis, 4,143,609, Cl. 112-262.000.

Matsubara, Kentaro; and Matsuo, Yoshio, to Tetsudo Kizai Kogyo Company Limited. Rail fastening apparatus. 4,143,818, Cl. 238-349.000.

Matsubara, Toru, to Toyo Ink Manufacturing Co., Ltd. Curable coating compositions. 4,144,283, Cl. 260-836.000.

Matsubayashi, Hiroshi: *See*—
Ueno, Hiroshi; Tsurumaru, Michiko; Otsuka, Shinya; Matsubayashi, Hiroshi; Aizawa, Masanori; Sano, Hiroki; and Suzuki, Yukio, 4,143,790, Cl. 220-458.000.

Matsui, Shigetomo: *See*—
Okamoto, Hiroshi; and Matsui, Shigetomo, 4,143,536, Cl. 72-342.000.

Matsumaru, Shizuo, to Nippon Kogaku K.K. Optical glass. 4,144,076, Cl. 106-47.00Q.

Matsumoto, Genichi: *See*—
Okumura, Yoshio; Tachibana, Kyozo; Sato, Hiroshi; and Matsumoto, Genichi, 4,144,559, Cl. 363-88.000.

Matsumoto, Hirofumi: *See*—
Wakebe, Yoshitaka; Matsumoto, Hirofumi; Momohara, Hiedo; Tsuchida, Yasuyuki; and Tomoshige, Kazuhiro, 4,143,557, Cl. 74-217.00B.

Matsumoto, Kunio, to Copal Company Limited. Flash synchronization controlling means for program type electric shutters. 4,143,955, Cl. 354-34.000.

Matsumoto, Masayuki; Nagatani, Toshio; and Fujimori, Noboru, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide photographic materials. 4,144,070, Cl. 96-66.00R.

Matsumoto, Takuzo: *See*—
Hara, Ryoichi; Yajima, Masamichi; Akai, Chiaki; and Matsumoto, Takuzo, 4,143,833, Cl. 242-158.00R.
Hara, Ryoichi; Yajima, Masamichi; Akai, Chiaki; and Matsumoto, Takuzo, 4,143,834, Cl. 242-158.00R.

Matsuo, Koichi: *See*—
Murakami, Noboru; Hirosawa, Koichiro; Ohara, Kazuo; and Matsuo, Koichi, 4,143,562, Cl. 74-753.000.

Matsuo, Yoshio: *See*—
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Matsuoka, Tadahiko: *See*—
Kodama, Tadashi; Murakami, Masayuki; Kimeda, Tsuneji; Matsuoka, Tadahiko; Hara, Osamu; and Tsukiyama, Satoru, 4,144,413, Cl. 179-90.00R.

Matsushita Electric Industrial Co., Ltd.: *See*—
Gamo, Takaharu; Moriwaki, Yoshio; Yamashita, Toshio; and Fukuda, Masataro, 4,144,103, Cl. 148-3.000.
Itoh, Kunio; and Inoue, Morio, 4,144,503, Cl. 331-94.50H.
Minami, Shunji, 4,144,484, Cl. 323-19.000.

Matsuura, Shigeo: *See*—
Umemura, Yoshiharu; and Matsuura, Shigeo, 4,144,512, Cl. 334-15.000.

Matsuyama, Takashi; Tsuda, Hiroshi; and Kasuga, Muneo, to Olympus Optical Company Limited. Device for controlling rotations of photosensitive drum for electrographic apparatus. 4,143,963, Cl. 355-14.000.

Matsuzaka, Eiichi: *See*—
Sato, Atsushi; Shimizu, Isoo; and Matsuzaka, Eiichi, 4,144,279, Cl. 260-668.00R.

Matthews, Denis, to Mathbirk, Limited. Method of using linking machines. 4,143,609, Cl. 112-262.000.

Matthews, Floyd G.: *See*—
Matthews, Wesley D., 4,143,740, Cl. 182-93.000.

Matthews, Gary J.; and Arnold, Robert A., to Syntex Corporation. Preparation of 2-aryl-propionic acids by direct coupling utilizing a mixed magnesium halide complex. 4,144,397, Cl. 562-466.000.

Matthews, Wesley D., to Matthews, Floyd G. Modular stairway system for installation on structures having non-linear walls. 4,143,740, Cl. 182-93.000.

Mattison Machine Works: *See*—
Meyers, Richard H.; and White, Dennis L., 4,143,776, Cl. 414-735.000.

Matz, Andrew R. Dialyzer, system and dialysis method. 4,144,165, Cl. 210-22.00C.

Maucher, Paul, to LuK Lamellen und Kupplungsbau GmbH. Disengaging bearing for clutches of motor vehicles. 4,143,748, Cl. 192-98.000.

Mauer, Gail B.: *See*—
Schlanger, Samuel L., 4,143,735, Cl. 180-91.000.

Maximovich, Boleslav I.: *See*—
Mozzhukhin, Anatoly A.; Dudko, Daniil A.; Sotchenko, Vladimir P.; and Maximovich, Boleslav I., 4,144,432, Cl. 219-9.500.

McCaffrey, James A., to Diversified Plastics Products Inc. Litter box. 4,143,800, Cl. 224-42.42R.

McCammon, John W.; and Imokawa, George, to Litton Systems, Inc. Coaxial line to double ridge waveguide transition. 4,144,506, Cl. 333-26.000.

McCarthy, Michael J.: *See*—
Radimer, Kenneth J.; and McCarthy, Michael J., 4,144,144, Cl. 204-82.000.

McCaulay, David A., to Standard Oil Company (Indiana). Octane upgrading of light naphtha streams using a fluorosulfonic acid, hydrofluoric acid and antimony pentafluoride catalyst. 4,144,282, Cl. 260-683.680.

McConway & Torley Corporation: *See*—
Oshinsky, Frank W.; and Brown, Thomas R., Sr., 4,143,701, Cl. 164-368.000.

McCorsley, Clarence C., III, to Akzona Incorporated. Process for making amine oxide solution of cellulose. 4,144,080, Cl. 106-186.000.

McCulloch, Roger L., to Boise Cascade Corporation. Folded blank container for receptacles. 4,143,768, Cl. 206-590.000.

McDaniel, Diana G. Friedcake and stick member combination and process for making same. 4,144,356, Cl. 426-91.000.

McDowell, William: *See*—
Groh, Edward F.; McDowell, William; Modjeski, Norbert S.; Keefe, Donald J.; and Groer, Peter, 4,144,454, Cl. 250-435.000.

McEowen, Victor R. Flexible joint construction. 4,143,983, Cl. 403-39.000.

McFarlin, Lloyd. Water filled seat cushion. 4,143,909, Cl. 297-284.000.

McGahern, William J., to General Electric Company. Method of making mounting assembly for laminated rotor rim of dynamoelectric generator rotatable about inclined shaft. 4,143,457, Cl. 29-598.000.

McGalliard, James D. Single mount electrical control device assembly. 4,144,555, Cl. 361-386.000.

McGehee, Richard S. Foul line detector circuit. 4,143,874, Cl. 273-50.000.

McGoveran, David O. Cable connector crimping apparatus. 4,143,459, Cl. 29-749.000.

McKnight, William B.: *See*—
Jennings, Walter B., Jr.; McKnight, William B.; and Milton, Richard D., 4,143,835, Cl. 244-311.000.

McMillin, John R.; and Strandwitz, Peter, to Cornelius Company, The. Apparatus and method for dispensing a carbonated beverage. 4,143,793, Cl. 222-1.000.

McNaney, Joseph T. Light beam position control system. 4,143,948, Cl. 350-358.000.

McNeel, William O., to Geo Space Corporation. Geophone having electromagnetic damping means. 4,144,520, Cl. 340-17.0SP.

McVey, Dale E.: *See*—
Murphy, Michael J.; McVey, Dale E.; Slipcheck, David A.; and Stefano, Gene E., 4,143,892, Cl. 285-149.000.

Mead Corporation, The: *See*—
Davis, Gerald T.; Schwab, Gerhart; and Shackle, Dale R., 4,143,890, Cl. 282-27.500.
Dickens, Luther I., 4,144,296, Cl. 264-45.400.

Meadows, Roger D.; and Duckett, John C., to Dayco Corporation. Textile apron and method of making same. 4,143,559, Cl. 74-231.00R.

Measuregraph Company, The: *See*—
Schwarz, Gail B., 4,144,575, Cl. 364-562.000.

Meier, Hans; and Dbaly, Jaroslav. Surgical retaining device. 4,143,652, Cl. 128-20.000.

Meinan Machinery Works, Inc.: *See*—
Hasegawa, Katsuji, 4,144,112, Cl. 156-313.000.

Melhorn, Barry J., to Ford Motor Company. Hydrokinetic torque converter with lock-up clutch and internal vibration damping. 4,143,561, Cl. 74-730.000.

Melton, Keith; and Mercier, Olivier, to BBC Brown, Boveri & Company, Limited. Shape memory alloys. 4,144,057, Cl. 75-134.00C.

Mengelers, Heinrich J.: *See*—
Absil, Joseph H.; and Mengelers, Heinrich J., 4,144,164, Cl. 209-12.000.

Meningand, Paul A.: *See*—
Bernard, Jean P.; and Meningand, Paul A., 4,143,840, Cl. 244-110.00C.

Menth, Anton: *See*—
Gaiffi, Sevi; Menth, Anton; and Nagel, Harmut, 4,144,105, Cl. 148-103.000.

Meratti, Gianattilio. Opener for opening signatures having an overlap. 4,143,438, Cl. 11-1.00R.

Mercier, Olivier: *See*—
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Merck & Co., Inc.: *See*—
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Bolhofer, William A., 4,144,338, Cl. 424-251.000.
Clark, Robert L.; Pessolano, Arsenio A.; and Shen, Tsung-Ying, 4,144,341, Cl. 424-256.000.
Colegrove, George T., 4,144,107, Cl. 149-60.000.
Jones, Howard; and Dorn, Conrad P., 4,144,271, Cl. 260-564.00R.
Mrozik, Helmut H.; and Kulsa, Peter, 4,144,345, Cl. 424-272.000.
Putter, Irving, 4,144,352, Cl. 424-279.000.
Shen, Tsung-Ying; Jones, Howard; and Dorn, Conrad P., 4,144,342, Cl. 424-263.000.

Mercurio, Richard N.: *See*—
Graham, Richard B.; and Mercurio, Richard N., 4,144,174, Cl. 210-527.000.

Merritt, James A., to United States of America, Army. Production of $B_{10}H_{14}$ from B_2H_6 at room temperature by laser induced chemistry using DF laser. 4,144,151, Cl. 204-157.10R.

Mertens, Ludovicus M.: *See*—
Vermeulen, Leon L.; and Mertens, Ludovicus M., 4,144,064, Cl. 96-29.00L.

Mesey, Milton M., to Maag Gear-Wheel & Machine Co. Ltd. Dressing device for plate-shaped grinding wheels of a gear tooth flank-grinding machine. 4,143,637, Cl. 125-11.0CC.

Messer Griesheim GmbH: *See*—
Boje, Jurgen; Bratengeier, Horst; Zaveta, Karel; and Schumann, Gunter, 4,143,929, Cl. 339-5.00M.
Hantelmann, Paul, 4,144,441, Cl. 219-74.000.
Herbener, Klaus; and Schmitt, Ewald, 4,143,860, Cl. 266-49.000.

Messerschmitt-Bolkow-Blohm GmbH: *See*—
Rieger, Ulrich, 4,143,836, Cl. 244-3.150.

Meszaros, Istvan: *See*—
Ryser, Urs; Meszaros, Istvan; Graf, Rudolf; and Reusser, Hans, 4,143,574, Cl. 83-698.000.

Metallgesellschaft Aktiengesellschaft: *See*—
Doerges, Alexander; and Schlauer, Johannes, 4,144,314, Cl. 423-210.000.
Rahn, Martin; Reh, Lothar; Thone, Bernd; and Vydra, Karel, 4,144,051, Cl. 75-9.000.
Serbent, Harry; and Schnabel, Wolfram, 4,144,052, Cl. 75-36.000.

Metatech Corporation: *See*—
Abramson, Harvey J., 4,143,853, Cl. 251-149.100.

Metzger, Sidney, to Communications Satellite Corporation. Satellite switching system. 4,144,495, Cl. 325-4.000.

Meyer, Burton C.; Nix, Donald F.; and Katzman, Allison W., to Marvin Glass & Associates. Amusement device. 4,143,482, Cl. 46-43.000.

Meyer, Willy: *See*—
Gsell, Laurenz; and Meyer, Willy, 4,144,330, Cl. 424-200.000.

Meyers, Richard H.; and White, Dennis L., to Mattison Machine Works. Apparatus for transferring and turning over parts. 4,143,776, Cl. 414-735.000.

Meysenburg, Helmut, to Energietechnik GmbH. Heating apparatus. 4,143,815, Cl. 237-2.00B.

Mezhuev, Alexandr T.: *See*—
Khimenko, Lev T.; Mezhuev, Alexandr T.; Legeza, Anatoly V.; Sljusarev, Andrei K.; Gavrjuschenko, Anatoly D.; Chudakov, Vyacheslav A.; and Baranov, Mikhail I., 4,143,532, Cl. 72-56.000.

Miano, Jeffrey D., to Pennwalt Corporation. Sodium tetraborate pentahydrate as a smoke suppressant for styrenic resins. 4,144,288, Cl. 260-880.00R.

Mid-Florida Mining Co.: *See*—
Colwell, Omar K., 4,144,078, Cl. 106-97.000.
Edgar, Allen C.; and Smith, George N., 4,144,162, Cl. 208-13.000.

Mikhailets, Georgy A.: *See*—
Vainshtein, Viktor A.; Kulbakh, Valter O.; Etingov, Evgeny D.; Naumchik, Grigory N.; Ekzemplyarov, Oleg N.; Mikhailets, Georgy A.; Grinberg, Grigory E.; and Egorenkova, Alla N., 4,144,328, Cl. 424-180.000.

Mile, Terez: *See*—
Bognar, Reszo; Makleit, Sandor; Kiss, Geza; Berenyi, Sandor; Mile, Terez; Knoll, Jozsef; Elek, Sandor; Gyoker, Istvan; Zoltai, Attila; Toth, Gyorgy; and Litkei, Laszlo, 4,144,236, Cl. 546-46.000.

Milianowicz, Stanislaw A.: *See*—
Kowalik, Peter M.; and Milianowicz, Stanislaw A., 4,144,426, Cl. 200-148.00A.

Miller, Frederick C.: *See*—
Joo', Louis A.; and Miller, Frederick C., 4,144,383, Cl. 429-218.000.

Miller, George B.; and Denapole, Jack K., to Miller, George B. Remotely responsive motion detector. 4,144,529, Cl. 340-562.000.

Miller, Roger L., to Kelsey-Hayes Co. Skid control system. 4,143,926, Cl. 303-92.000.

Miller, Viktor Y.: *See*—
Kandakov, Gennady P.; Miller, Viktor Y.; Sorokin, Lev A.; and Sukhorukov, Alexandr E., 4,143,704, Cl. 165-9.200.

Milliken Research Corporation: *See*—
Habib, Emile E., 4,144,027, Cl. 8-127.600.
Hauser, Peter J.; Hendrix, James E.; and Kuhn, Hans H., 4,144,028, Cl. 8-164.000.

Milton, Richard D.: *See*—
Jennings, Walter B., Jr.; McKnight, William B.; and Milton, Richard D., 4,143,835, Cl. 244-311.000.

Minami, Shunji, to Matsushita Electric Industrial Co., Ltd. DC Voltage control device. 4,144,484, Cl. 323-19.000.

Minegishi, Yutaka; and Arai, Haruhiko, to Kao Soap Co., Ltd. Softener composition for fabrics. 4,144,177, Cl. 252-8.800.

Minkin, Gary E., to Mart Corporation, The. Power parts washer. 4,143,669, Cl. 134-153.000.

Minnesota Mining and Manufacturing Company: *See*—
Beck, Warren R., 4,144,372, Cl. 428-283.000.
Landucci, Dennis P., 4,144,367, Cl. 428-96.000.
Rambosek, G. Phillip; and Thiel, Charles G., 4,143,658, Cl. 128-184.000.

Minohara, Kiyomi; and Sonoda, Koichi, to Furuno Electric Co., Ltd. Stabilized-transducer driving device for underwater ultrasonic detection system. 4,144,518, Cl. 340-3.0PS.

Minolta Camera Kabushiki Kaisha: *See*—
Fujimoto, Hirohisa; Suzuki, Norihiko; Shibazaki, Kenji; and Arai, Kenichi, 4,143,570, Cl. 83-205.000.

Mirtain, Henri J.: *See*—
Igea, Gilbert L.; Mirtain, Henri J.; and Uniroyal, 4,143,697, Cl. 152-340.000.

Misch, Roger A.: *See*—
Erspamer, James R.; Jackson, John R.; Misch, Roger A.; and Waldrop, John L., 4,143,467, Cl. 33-356.000.

Mishima, Yoshinari: *See*—
Hamoto, Hideaki; Ogino, Maao; Yoshida, Mitsunobu; Mishima, Yoshinari; and Yoshizawa, Akiho, 4,144,293, Cl. 261-93.000.

Misjurev, Vladimir I.: *See*—
Yaroshenko, Jury F.; Gonsales, Rodriges S.; Rogozhin, Sergei V.; and Misjurev, Vladimir I., 4,143,591, Cl. 99-483.000.

Mitschke, Karl-Heinz, to Bayer Aktiengesellschaft. Production of bromoaryl chlorophosphates. 4,144,290, Cl. 260-986.000.

Mitschke, Karl-Heinz; and Boehmke, Gunther, to Bayer Aktiengesellschaft. Process for the preparation of bromoaroxyl-alkyl-(β-chloroalkyl) phosphates. 4,144,291, Cl. 260-986.000.

Mitsubishi Chemical Industries Limited: *See*—
Imai, Haruo; Oohama, Tadashi; Yamaguchi, Ryozo; and Ninomiya, Kunihiro, 4,144,254, Cl. 260-397.400.
Okano, Takeshi; Wada, Naoto; and Kobayashi, Yoshimitsu, 4,144,396, Cl. 560-246.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Sakakibara, Yosihiro; and Awano, Takeshi, 4,143,911, Cl. 297-341.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Takahashi, Yasuro; Yamamoto, Hisao; Sakai, Masayasu; and Takegawa, Toshiyuki, 4,144,016, Cl. 431-8.000.

Mitsubishi Kakoki Kaisha Ltd.: *See*—
Moriguchi, Masahiro, 4,143,806, Cl. 233-20.00A.

Mitsui Petrochemical Industries, Ltd.: *See*—
Yatsu, Tadao; and Higashi, Isaburo, 4,144,388, Cl. 526-9.000.

Mitsuya, Yoshihide, to Sakura Color Products Corporation. Memorizing aid. 4,143,473, Cl. 35-76.000.

Mittnacht, Hans; Echte, Adolf; Jenne, Helmut; Lieb, Manfred; Bronstert, Klaus; and Adler, Hansjoerg, to BASF Aktiengesellschaft. Impact-resistant thermoplastic molding compositions with increased stress crack resistance. 4,144,204, Cl. 260-4.0AR.

Miya, Bunji; Sawamoto, Yuzi; Hashiba, Kunizo; and Hisamitsu, Shizuo, to Kao Soap Co., Ltd. Process for preparation for copper-iron-aluminum catalysts and catalysts prepared by the process. 4,144,198, Cl. 252-466.00J.

Miyagawa, Fumihiro, to Ricoh Company, Ltd. Camera with date entry. 4,143,956, Cl. 354-106.000.

Miyakawa, Tadashi; Nakane, Masayoshi; Watanabe, Masafumi; and Osaka, Yoshio, to Tokyo Shibaura Electric Co., Ltd. Counting level "1" bits to minimize ROM active elements. 4,144,587, Cl. 365-94.000.

Miyashita, Kunio; Okuda, Hironori; Yamashita, Seizi; and Tanabe, Shoji, to Hitachi, Ltd. Stress protection for permanent magnet type synchronous motor. 4,144,469, Cl. 310-156.000.

Mizukami, Yoshikatsu: *See*—
Yamanaka, Keio; Okamoto, Kazuo; and Mizukami, Yoshikatsu, 4,144,225, Cl. 260-45.9NC.

Mizutani, Nagao: *See*—
Kurihara, Tohio; Mizutani, Nagao; Okawara, Yasuo; Nojima, Masamitsu; and Kunita, Masao, 4,143,977, Cl. 400-56.000.

Mlavsky, Abraham I., to Mobil Tyco Solar Energy Corporation. Solar energy assembly. 4,144,095, Cl. 136-89.0PC.

Mobil Oil Corporation: *See*—
Anderson, James J.; Camacho, Vasco G.; Kinney, Robert E.; and Seger, Francis M., 4,144,387, Cl. 521-174.000.
Andress, Harry J., Jr., 4,144,180, Cl. 252-32.500.

Mobil Tyco Solar Energy Corporation: *See*—
Mlavsky, Abraham I., 4,144,095, Cl. 136-89.0PC.

Mod, Robert R.; Harris, James A.; Arthur, Jett C., Jr.; Magne, Frank C.; Sumrell, Gene; and Novak, Arthur F., to United States of America, Agriculture. Antimicrobial fatty acid derivatives. 4,144,256, Cl. 260-402.500.

Modjeski, Norbert S.: *See*—
Groh, Edward F.; McDowell, William; Modjeski, Norbert S.; Keefe, Donald J.; and Groer, Peter, 4,144,454, Cl. 250-435.000.

Mohammed, Kasheed, to Johnson & Johnson. Preventing the Maillard reaction in synthetic dietary compositions. 4,144,357, Cl. 426-96.000.

Momiyama, Iwao: *See*—
Itoh, Hitoshi; and Momiyama, Iwao, 4,144,074, Cl. 106-1.170.

Momohara, Hiedo: *See*—
Wakebe, Yoshitaka; Matsumoto, Hirofumi; Momohara, Hiedo; Tsuchida, Yasuyuki; and Tomoshige, Kazuhiro, 4,143,557, Cl. 74-217.00B.

Monot, Christian, to Societe Nouvelle Youpa-La. Folding cot. 4,143,434, Cl. 5-99.00R.

Monroe Auto Equipment Company: *See*—
Grueschow, Clifford H., 4,144,169, Cl. 210-168.000.

West, Burke A.; and Bethell, Michael R., 4,143,729, Cl. 180-5.00R.
Monsanto Company: *See—*
Crutchfield, Marvin M.; Papanu, Victor D.; and Warren, Craig B., 4,144,226, Cl. 528-231.000.
Franz, John E.; and Howe, Robert K., 4,144,047, Cl. 71-90.000.
Johnson, Anders A., 4,144,308, Cl. 422-245.000.
Morgan, Albert W.; Schumacher, Ignatius; and Vanderlinde, William, 4,144,394, Cl. 544-84.000.
Snelgrove, James A.; and Christensen, Donald I., 4,144,217, Cl. 260-31.80W.
Montedison S.p.A.: *See—*
Consoli, Salvatore; and Galati, Franco, 4,144,386, Cl. 521-167.000.
Corbacella, Carlo, 4,144,214, Cl. 260-23.00H.
Morello, Michael E.; and Cochran, Thomas E., to Caterpillar Tractor Co. Hood panel support structure. 4,143,733, Cl. 180-69.00R.
Morgan, Albert W.; Schumacher, Ignatius; and Vanderlinde, William, to Monsanto Company. Phosphoroamidates. 4,144,394, Cl. 544-84.000.
Morgan Fairest Limited: *See—*
Eldred, Paul J., 4,143,754, Cl. 198-379.000.
Morgner, Robert O.: *See—*
Kinkade, Charles E.; Morgner, Robert O.; and Sharp, Harold L., 4,143,560, Cl. 74-473.00R.
Mori, Atsuo; Okita, Taisuke; Kitamura, Shuji; Kotani, Kozo; and Hama, Masaaki, to Sumitomo Chemical Company, Limited. Adhesive composition. 4,144,113, Cl. 156-334.000.
Moriguchi, Masahiro, to Mitsubishi Kakoki Kaisha Ltd. Centrifugal separator. 4,143,806, Cl. 233-20.00A.
Morikawa, Nobutaka: *See—*
Konishi, Masami; Futamura, Kazumasa; Noda, Takashi; and Morikawa, Nobutaka, 4,143,513, Cl. 60-282.000.
Morimoto, Toshiaki: *See—*
Katahira, Yukio; and Morimoto, Toshiaki, 4,143,952, Cl. 352-221.000.
Morishita, Taneji: *See—*
Kimura, Yoshiaki; Takeuchi, Yoshio; Yamada, Mikio; Morishita, Taneji; and Yajima, Tatsuo, 4,144,537, Cl. 346-140.00R.
Moriwaki, Yoshio: *See—*
Gamo, Takaharu; Moriwaki, Yoshio; Yamashita, Toshio; and Fukuda, Masataro, 4,144,103, Cl. 148-3.000.
Morrison, Glenn C.: *See—*
Cetenko, Wiaczeslaw A.; and Morrison, Glenn C., 4,144,349, Cl. 424-274.000.
Morrow, James G., Sr., to Manitowoc Company, Inc., The. Split drive system for dragline with power interlock. 4,143,856, Cl. 254-185.00R.
Moser, Alfred: *See—*
Augustin, Hubert; Friesenbichler, Eduard; and Moser, Alfred, 4,144,442, Cl. 219-106.000.
Moser, Paul, to Ciba-Geigy Corporation. Phosphonate stabilizers. 4,144,224, Cl. 260-45.75N.
Moss, L. Howard, III. Shipper container for flasks. 4,143,764, Cl. 206-429.000.
Moss, L. Howard, III. Shipper tray for tissue culture dishes. 4,143,765, Cl. 206-445.000.
Moss, Philip H.; and Yeakey, Ernest L., to Texaco Development Corporation. Detergent and corrosion inhibited motor fuel composition. 4,144,035, Cl. 44-71.000.
Mosse, Alfred L.: *See—*
Dementiev, Valentin V.; Zhidovich, Anatoly I.; Mosse, Alfred L.; Yasko, Oleg I.; Polak, Lev S.; Gulyaev, Genrikh V.; Levenzon, Rafail I.; Volodin, Nikolai L.; Vurzel, Filipp B.; and Laktjushin, Alexandr N., 4,144,444, Cl. 219-383.000.
Mostmans, Joseph H.: *See—*
Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph H., 4,144,346, Cl. 424-273.00R.
Motorola, Inc.: *See—*
Andrea, Ralph W., III, 4,144,497, Cl. 325-302.000.
Coleman, Michael G.; Grenon, Lawrence A.; Pryor, Robert A.; and Restrepo, Fabio, 4,144,094, Cl. 136-89.0CC.
Mount Hill, Edith K.: *See—*
Wetherall, Henry E.; and Mount Hill, Edith K., 4,143,899, Cl. 294-50.900.
Mourier, Georges, to Thomson-CSF. Amplifying rotary electrical machine operating at rapidly variable frequencies and levels. 4,144,468, Cl. 310-72.000.
Mourlan, Jany: *See—*
Semanaz, Daniel; and Mourlan, Jany, 4,144,284, Cl. 260-857.0PA.
Mozzhukhin, Anatoly A.; Dudko, Daniil A.; Sotchenko, Vladimir P.; and Maximovich, Boleslav I. Apparatus for surfacing valves for internal combustion engines. 4,144,432, Cl. 219-9.500.
MPJ Developments Limited: *See—*
Sequeira, Peter J. L., 4,144,135, Cl. 195-120.000.
Mrozik, Helmut H.; and Kulsa, Peter, to Merck & Co., Inc. Dihydroxybenzisoxazolin-3-yl-substituted-5-nitroimidazoles as antibacterials and antiprotozoals. 4,144,345, Cl. 424-272.000.
Mueller, Martin; and Schoenfeld, Harald, to Carl Schenck AG. Method and apparatus for monitoring and/or correcting of a physical characteristic. 4,144,578, Cl. 364-575.000.
Murai, Ryukichi; and Tubata, Noritaka, to Yoshida Kogyo K.K. Concealed slide fastener. 4,143,680, Cl. 139-384.00B.
Murakami, Masayuki: *See—*
Kodama, Tadashi; Murakami, Masayuki; Kimeda, Tsuneji; Matsuoka, Tadahiko; Hara, Osamu; and Tsukiyama, Satoru, 4,144,413, Cl. 179-90.00R.
Murakami, Noboru; Hirosawa, Koichiro; Ohara, Kazuo; and Matsuo, Koichi, to Aisin Seiki Kabushiki Kaisha. Speed change gear. 4,143,562, Cl. 74-753.000.
Murakawa, Shuji: *See—*
Ando, Yujiro; Ishihara, Shunichi; Murakawa, Shuji; and Ohara, Katsunobu, 4,143,965, Cl. 355-35.00C.
Murasawa, Sadao: *See—*
Takahata, Kei; Murasawa, Sadao; and Maruo, Masatsuyo, 4,144,184, Cl. 252-62.10L.
Murata, Hiroshi: *See—*
Murata, Yasuzo; Yokoyama, Takeo; and Murata, Hiroshi, 4,143,472, Cl. 35-66.000.
Murata Manufacturing Co., Ltd.: *See—*
Togawa, Kazuya; and Masaie, Kimio, 4,144,501, Cl. 329-118.000.
Murata, Minoru: *See—*
Unno, Naoyuki; Yoshino, Mutsuyuki; and Murata, Minoru, 4,144,354, Cl. 426-2.000.
Murata, Yasuzo; Yokoyama, Takeo; and Murata, Hiroshi, to Pilot Man-Nen Hitsu Kabushiki Kaisha. Displaying magnetic panel and its display device. 4,143,472, Cl. 35-66.000.
Murday, William, to Winster Mining Limited. Mining conveyor assemblies with control boxes on fence. 4,143,918, Cl. 299-43.000.
Murdoch, Francis J.: *See—*
Layden, Owen P.; and Murdoch, Francis J., 4,143,543, Cl. 73-827.000.
Murib, Jawad H., to National Distillers and Chemical Corporation. Process for the preparation of acrolein and acrylic acid. 4,144,398, Cl. 562-524.000.
Murphy, John R.; and Pizzini, Louis C., to BASF Wyandotte Corporation. Process for the preparation of polyether-ester polyols. 4,144,395, Cl. 560-200.000.
Murphy, Michael J.; McVey, Dale E.; Slipcheck, David A.; and Stefano, Gene E., to Gates Rubber Company, The. Hose coupling. 4,143,892, Cl. 285-149.000.
Murtezov, Dzhihan S.: *See—*
Murtezov, Sezhaidin M.; and Murtezov, Dzhihan S., 4,143,530, Cl. 70-165.000.
Murtezov, Sezhaidin M.; and Murtezov, Dzhihan S., to NOP "Technologia Na Metalite". Lockable gas cap assemblies. 4,143,530, Cl. 70-165.000.
Murty, Hari N., to Carborundum Company, The. Granular activated carbon manufacture from sub-bituminous coal treated with dilute inorganic acid. 4,144,193, Cl. 252-444.000.
Music Specialities Corp.: *See—*
Stevens, Harold E., 4,144,490, Cl. 324-78.00D.
Mutschler, Erich; and Weber, Adam, to SWF-Spezialfabrik fur Autozubehor Gustave Rau GmbH. Steering column switch mounting. 4,144,425, Cl. 200-61.540.
Mutton, David E.; and Boyd, Edward G. C. A., to National Research Development Corporation. Devices for measuring planar area within a closed curved path. 4,144,576, Cl. 364-564.000.
Naarden International, N.V.: *See—*
Wille, Hans J.; Konst, Wilhelmus M. B.; and Kos, Jan, 4,144,199, Cl. 252-522.000.
Naganawa, Hiroshi: *See—*
Umezawa, Hamao; Takeuchi, Tomio; Naganawa, Hiroshi; Ishizuka, Masaaki, all of; Shibamoto, Norio; Oki, Toshikazu; and Inui, Taiji, 4,144,329, Cl. 424-181.000.
Nagasaki, Tadashi; Akatsu, Mitsuharu; and Otsu, Mitsuo, to Hitachi, Ltd. High voltage generating apparatus. 4,144,480, Cl. 315-411.000.
Nagasubramanian, Krishnamurthy; Chlanda, Frederick P.; and Liu, Kang-Jen, to Allied Chemical Corporation. Process for manufacture of anhydrous hydrogen fluoride and finely divided silica from fluosilicic acid. 4,144,158, Cl. 204-180.00P.
Nagatani, Toshio: *See—*
Matsumoto, Masayuki; Nagatani, Toshio; and Fujimori, Noboru, 4,144,070, Cl. 96-66.00R.
Nagel, Harmut: *See—*
Gaiffi, Sevi; Menth, Anton; and Nagel, Harmut, 4,144,105, Cl. 148-103.000.
Nagy, Art; and Proudian, Andrew P., to Second Foundation. Ultrasonic scanner. 4,143,554, Cl. 73-641.000.
Nagy, Ernest J., to Pullman Incorporated. Acceleration indicator. 4,143,615, Cl. 116-46.000.
Naidenova, Nina G.: *See—*
Pyatnitskaya, Irina N.; Ivanov, Vladimir I.; Borovkova, Nina K.; and Naidenova, Nina G., 4,144,348, Cl. 424-274.000.
Nakagawa, Tadashi: *See—*
Nemoto, Ichiro; Nakagawa, Tadashi; Watanabe, Masanori; Koyama, Mitsuo; and Onda, Eiichi, 4,143,957, Cl. 354-266.000.
Nakai, Shinji: *See—*
Masuko, Fujio; Fujiyoshi, Kazuhiko; Ume, Yoshitaka; Nakai, Shinji; Kitamura, Shigeyoshi; and Umemura, Takeaki, 4,144,264, Cl. 260-465.00G.
Nakajima, Fumio; Nikaido, Akira; Onda, Mitsuo; Machida, Takayasu; and Toida, Takashi, to Citizen Watch Co., Ltd. Pulse motor. 4,144,467, Cl. 310-49.00R.
Nakajima, Junya: *See—*
Ishibashi, Hiroshi; Sakai, Nobuo; Imai, Kiyoshi; and Nakajima, Junya, 4,144,068, Cl. 96-60.00R.
Nakako, Yukio; and Yokota, Shizuo, to Kobe Steel, Ltd. Process for manufacturing metallurgical cabonaceous materials from coals. 4,144,033, Cl. 44-1.00F.

Nakamoto, Hiroo. Electrophotographic duplication apparatus. 4,143,961, Cl. 355-5.000.

Nakamura, Gisaku: *See—*
Yonezawa, Susumu; Torii, Yasuhiro; Ogiwara, Haruo; and Nakamura, Gisaku, 4,143,937, Cl. 350-3.820.

Nakamura, Mitsuo: *See—*
Norimatsu, Hideaki; and Nakamura, Mitsuo, 4,143,623, Cl. 123-32.0EE.

Nakamura, Teruo: *See—*
Shibuya, Tsunenori; Ishizuka, Yutaka; and Nakamura, Teruo, 4,144,002, Cl. 418-76.000.

Nakane, Masayoshi: *See—*
Miyakawa, Tadashi; Nakane, Masayoshi; Watanabe, Masafumi; and Osaka, Yoshio, 4,144,587, Cl. 365-94.000.

Nakayama, Hiroyuki: *See—*
Araki, Kunio; Makuuchi, Keizo; Takagi, Tohru; and Nakayama, Hiroyuki, 4,144,155, Cl. 204-159.220.

Nakazono, Jiro; Kodama, Akihiko; and Tsuchiya, Yukio, to Pioneer Electronic Corporation. Loudspeaker driver unit. 4,143,738, Cl. 181-159.000.

Naslund, Gustav, to Korstrask Mekaniska, G Naslund. Roofing sheet. 4,143,499, Cl. 52-630.000.

National Distillers and Chemical Corporation: *See—*
Murib, Jawad H., 4,144,398, Cl. 562-524.000.

National Presto Industries, Inc.: *See—*
Walker, Duane H., 4,143,787, Cl. 220-203.000.

National Research Development Corporation: *See—*
Mutton, David E.; and Boyd, Edward G. C. A., 4,144,576, Cl. 364-564.000.

National Union Electric Corporation: *See—*
Brooks, Joseph F.; Hohulin, Samuel E.; and Lockhart, Scott N., 4,143,441, Cl. 15-369.000.

Naumchik, Grigory N.: *See—*
Vainshtein, Viktor A.; Kulbakh, Valter O.; Etingov, Evgeny D.; Naumchik, Grigory N.; Ekzemplyarov, Oleg N.; Mikhailets, Georgy A.; Grinberg, Grigory E.; and Egorenkova, Alla N., 4,144,328, Cl. 424-180.000.

Nazareth, Edward R. L.: *See—*
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NCR Corporation: *See—*
Cooper, Paul J., 4,144,562, Cl. 364-200.000.

Neiman S.A.: *See—*
Weber, Gunter; and Schaumburg, Gunter, 4,143,528, Cl. 70-1.500.

Nelbock-Hochstetter, Michael: *See—*
Gruber, Wolfgang; Bergmeyer, Hans U.; Nelbock-Hochstetter, Michael; Beaucamp, Klaus; Holz, Gunter; Gramsall, Johanna; and Lang, Gunter, 4,144,129, Cl. 195-66.00R.

Nelson, Albert O.: *See—*
Burkett, Albert L.; and Nelson, Albert O., 4,144,167, Cl. 210-104.000.

Nelson, Frank M.: *See—*
Donohue, James M.; Ling, Andrew T.; Malinich, Richard M.; and Nelson, Frank M., 4,144,550, Cl. 364-107.000.

Nelson Industries, Inc.: *See—*
Nordlie, Kenneth D., 4,143,739, Cl. 181-265.000.

Nemag, B.V.: *See—*
van Huuksloot, Leendert, 4,143,901, Cl. 294-70.000.

Nemoto, Ichiro; Nakagawa, Tadashi; Watanabe, Masanori; Koyama, Mitsuo; and Onda, Eiichi, to Seiko Koki Kabushiki Kaisha. Control device of shutter for camera. 4,143,957, Cl. 354-266.000.

Nemtsov, Nikolai S.; Vasiliev, Viktor I.; Tarasov, Vladimir P.; Pliskanovsky, Stanislav T.; Shokul, Anatoly A.; Kravchenko, Anatoly P.; Kraizinger, Fedor V.; and Krjukov, Ivan I., to Zhdanovsky Metallurgichesky Institut. Blast furnace charging device. 4,143,777, Cl. 414-170.000.

Neri, Rudolph O.; and Topliss, John G., to Schering Corporation. Substituted anilides as anti-androgens. 4,144,270, Cl. 260-562.00R.

Netherton, Charles F.: *See—*
Jandeska, William F.; and Netherton, Charles F., 4,144,060, Cl. 75-226.000.

Neubauer, Frank, to Transkirt Corporation. Negotiable document. 4,143,891, Cl. 282-27.500.

Neumann, John W., to Oxy Metal Industries Corporation. Fluid rail conveying apparatus. 4,144,021, Cl. 432-58.000.

NGK Spark Plug Co., Ltd.: *See—*
Nishio, Kanemitsu; and Takagi, Shunichi, 4,144,474, Cl. 315-53.000.

Nicholas, Charles P.; and Hooper, Richard. Variable floating hidden hook fishing lure. 4,143,478, Cl. 43-42.100.

Nicholas, David C., to Rockwell International Corporation. Network synchronization apparatus. 4,144,414, Cl. 179-15.0BS.

Nicholas, Terry G.; and Oostenbrink, Albertus A., to Wavin B.V. Sealing member for spigot-and-socket pipe coupling. 4,143,884, Cl. 277-207.00A.

Nichols, Joseph C.; Berner, John M.; and Fernandez, Mario F. Capo. 4,143,576, Cl. 84-318.000.

Nickerson, Roy S., Sr.: *See—*
Novotny, Jerome L.; and Nickerson, Roy S., Sr., 4,143,468, Cl. 34-1.000.

Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.): *See—*
Katahira, Yukio; and Morimoto, Toshiaki, 4,143,952, Cl. 352-221.000.

Nihon Technical Kabushiki Kaisha: *See—*
Ohashi, Tamaki, 4,143,555, Cl. 74-10.330.

Nikaido, Akira: *See—*
Nakajima, Fumio; Nikaido, Akira; Onda, Mitsuo; Machida, Takayasu; and Toida, Takashi, 4,144,467, Cl. 310-49.00R.

Nilsson, Nils A.: *See—*
Hernestam, Sven E. H.; Nilsson, Nils A.; and Willard, Lars-Olof, 4,144,320, Cl. 424-48.000.

Ninomiya, Kunihiro: *See—*
Imai, Haruo; Oohama, Tadashi; Yamaguchi, Ryozo; and Ninomiya, Kunihiro, 4,144,254, Cl. 260-397.400.

Nippon Asbestos Co., Ltd.: *See—*
Otouma, Takashi; Asaumi, Hiroshi; Kubota, Kazuo; and Yamamoto, Mitsuo, 4,144,121, Cl. 162-145.000.

Nippon Electric Co., Ltd.: *See—*
Koga, Toshio, 4,144,543, Cl. 358-136.000.
Tokunaga, Tadatsugu, 4,144,500, Cl. 325-480.000.
Utano, Takanori; Sakamoto, Masayuki; and Takayama, Yoshikazu, 4,144,409, Cl. 179-2.0EB.

Nippon Kogaku K.K.: *See—*
Matsumaru, Shizuo, 4,144,076, Cl. 106-47.00Q.

Nippon Petrochemicals Company, Limited: *See—*
Sato, Atsushi; Shimizu, Isoo; and Matsuzaka, Eiichi, 4,144,279, Cl. 260-668.00R.

Nippon Soken, Inc.: *See—*
Akita, Sigeyuki; and Kitagawa, Junji, 4,144,403, Cl. 174-52.00R.
Akita, Sigeyuki, 4,144,485, Cl. 323-44.00R.
Noguchi, Masaaki; Bunda, Tsuchio; and Tanaka, Taro, 4,143,620, Cl. 123-3.000.
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,143,627, Cl. 123-75.00B.

Nippon Telegraph and Telephone Public Corporation: *See—*
Ito, Sadao; Yoshikawa, Noriaki; and Komura, Mitsuru, 4,144,412, Cl. 179-2.0EB.
Kodama, Tadashi; Murakami, Masayuki; Kimeda, Tsuneji; Matsuoka, Tadahiko; Hara, Osamu; and Tsukiyama, Satoru, 4,144,413, Cl. 179-90.00R.
Utano, Takanori; Sakamoto, Masayuki; and Takayama, Yoshikazu, 4,144,409, Cl. 179-2.0EB.
Yonezawa, Susumu; Torii, Yasuhiro; Ogiwara, Haruo; and Nakamura, Gisaku, 4,143,937, Cl. 350-3.820.

Nippondenso Co., Ltd.: *See—*
Norimatsu, Hideaki; and Nakamura, Mitsuo, 4,143,623, Cl. 123-32.0EE.

Nishimura, Sanji: *See—*
Watanabe, Morio; and Nishimura, Sanji, 4,144,145, Cl. 204-89.000.

Nishio, Kanemitsu; and Takagi, Shunichi, to NGK Spark Plug Co., Ltd. Low noise resistance containing spark plug. 4,144,474, Cl. 315-53.000.

Nissan Motor Company, Limited: *See—*
Fujii, Toshihiko, 4,143,587, Cl. 93-1.00D.
Iizuka, Haruhiko; and Yasuhara, Seishi, 4,143,635, Cl. 123-198.00F.
Kobayashi, Osamu, 4,143,882, Cl. 277-96.200.
Takeda, Noriyuki; and Kawamoto, Tamio, 4,144,424, Cl. 200-61.880.

Nitto Electric Industrial Co., Ltd.: *See—*
Noda, Yuzuru; Yoshihara, Mitsuo; and Takigawa, Toshio, 4,144,210, Cl. 260-29.20N.

Nix, Donald F.: *See—*
Meyer, Burton C.; Nix, Donald F.; and Katzman, Allison W., 4,143,482, Cl. 46-43.000.

Noack, Christian; Oliva, Klaus; Eistert, Theodor; Zumpf, Bernd; Spaida, Hans P.; John, Gunter; Pietschmann, Frank; Boltizar, Pal; Fabry, Istvan; Vida, Csongor; Lakos, Lajos; and Klement, Matyas, to Veb Kombinat Fortschritt Landmaschinen Neustadt In Sachsen. Cornstalk harvester. 4,143,504, Cl. 56-98.000.

Noble, David: *See—*
Fleming, Ian D.; Noble, David; Noble nee Gillett, Hazel M.; and Wall, Wilfred F., 4,144,242, Cl. 260-307.0FA.

Noble nee Gillett, Hazel M.: *See—*
Fleming, Ian D.; Noble, David; Noble nee Gillett, Hazel M.; and Wall, Wilfred F., 4,144,242, Cl. 260-307.0FA.

Noda, Takashi: *See—*
Konishi, Masami; Futamura, Kazumasa; Noda, Takashi; and Morikawa, Nobutaka, 4,143,513, Cl. 60-282.000.

Noda, Yuzuru; Yoshihara, Mitsuo; and Takigawa, Toshio, to Nitto Electric Industrial Co., Ltd. Water-solubilized resin composition. 4,144,210, Cl. 260-29.20N.

Noguchi, Hiroshi: *See—*
Yoshida, Ryo; Sumida, Seizo; Itooka, Eiyoshi; Noguchi, Hiroshi; and Kamoshita, Katsuzo, 4,144,049, Cl. 71-120.000.

Noguchi, Masaaki; Bunda, Tsuchio; and Tanaka, Taro, to Nippon Soken, Inc. Fuel reforming system. 4,143,620, Cl. 123-3.000.

Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, to Nippon Soken, Inc. Internal combustion engine. 4,143,627, Cl. 123-75.00B.

Nojima, Masamitsu: *See—*
Kurihara, Tohio; Mizutani, Nagao; Okawara, Yasuo; Nojima, Masamitsu; and Kunita, Masao, 4,143,977, Cl. 400-56.000.

Noland, Richard D. Baghouse with double pass traveling purge head. 4,144,042, Cl. 55-287.000.

Nolte, Wilfried: *See—*
Casper, Rudolf; Nolte, Wilfried; and Braese, Hans, 4,144,286, Cl. 260-876.00R.

Nomura, Junji: *See—*
Inoue, Akio; Iwasa, Toshio; Sasaguri, Kiichiro; Amano, Toshihiko; and Nomura, Junji, 4,144,299, Cl. 264-558.000.

NOP "Technologia Na Metalite": *See*—
Murtezov, Sezhaidin M.; and Murtezov, Dzhihan S., 4,143,530, Cl. 70-165.000.
Nordlie, Kenneth D., to Nelson Industries, Inc. Concentric pass-type muffler construction. 4,143,739, Cl. 181-265.000.
Nordson Corporation: *See*—
Hastings, Donald R., 4,143,819, Cl. 239-707.000.
Norimatsu, Hideaki; and Nakamura, Mitsuo, to Nippondenso Co., Ltd. Air-to-fuel ratio feedback control system for internal combustion engines. 4,143,623, Cl. 123-32.0EE.
Norman, Royal L., to Rinn Corporation. Method and device for radiographing human jaw joints. 4,144,460, Cl. 250-451.000.
Norton Company: *See*—
Malloy, John F., 4,144,219, Cl. 260-33.8UB.
Norton, J. Clyde: *See*—
Karsh, Herbert; and Norton, J. Clyde, 4,143,538, Cl. 73-2.000.
Nossen, Edward J.; and Starner, Eugene R., to RCA Corporation. Arithmetic synthesizer frequency generation with reduced phase jitter. 4,144,579, Cl. 364-607.000.
Nossen, Edward J.: *See*—
Starner, Eugene R.; and Nossen, Edward J., 4,144,572, Cl. 364-487.000.
Novak, Arthur F.: *See*—
Mod, Robert R.; Harris, James A.; Arthur, Jett C., Jr.; Magne, Frank C.; Sumrell, Gene; and Novak, Arthur F., 4,144,256, Cl. 260-402.500.
Novatome Industries: *See*—
Deshais, Richard, 4,143,997, Cl. 417-50.000.
Novotny, Jerome L.; and Nickerson, Roy S., Sr. Inert atmosphere chamber. 4,143,468, Cl. 34-1.000.
NRM Corporation: *See*—
Enders, George E., 4,144,114, Cl. 156-414.000.
Singh, Anand P., 4,144,007, Cl. 425-34.00R.
Sponaugle, Lloyd B., 4,144,011, Cl. 425-192.00R.
Numata, Saburo; and Okazaki, Shinichiro, to Fuji Photo Optical Co., Ltd. Light emitting indicator for a camera. 4,143,954, Cl. 354-23.00D.
Nunotani, Sadao: *See*—
Furukawa, Ken; and Nunotani, Sadao, 4,143,719, Cl. 173-1.000.
Nuver, Eric L. H., to Esquire, Inc. Lamp system take control dimming circuit. 4,144,478, Cl. 315-291.000.
N.V. Bakaert S.A.: *See*—
Claes, Jozef; and De Bruyne, Roger, 4,144,040, Cl. 55-97.000.
O'Connor, Alton J., to Walbro Corporation. Fluid pump. 4,143,998, Cl. 417-413.000.
Oddo, Eugene P., to Addressograph-Multigraph Corporation. Sheet guide apparatus for diazo copying machines. 4,143,969, Cl. 355-100.000.
Oertle, Donald H.: *See*—
Peterson, Marvin L.; and Oertle, Donald H., 4,143,540, Cl. 73-40.000.
Offenbacher, Lon A., to General Motors Corporation. Weatherstrip sealing arrangement. 4,143,497, Cl. 52-400.000.
Offermanns, Heribert; Klingler, Karl H.; Thiemer, Klaus; and Stroman, Fritz, to Deutsche Gold und Silber- Scheideanstalt vormals Roessler. Basic substituted xanthine derivatives. 4,144,340, Cl. 424-253.000.
Offermanns, Heribert: *See*—
Klenk, Herbert; Lussling, Theodor; Maierhofer, Alfred; Offermanns, Heribert; and Wagner, Hans, 4,144,269, Cl. 260-545.00R.
Ogawa, Masaaki: *See*—
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Ogino, Maso: *See*—
Hamoto, Hideaki; Ogino, Maao; Yoshida, Mitsunobu; Mishima, Yoshinari; and Yoshizawa, Akiho, 4,144,293, Cl. 261-93.000.
Ogiwara, Haruo: *See*—
Yonezawa, Susumu; Torii, Yasuhiro; Ogiwara, Haruo; and Nakamura, Gisaku, 4,143,937, Cl. 350-3.820.
Ogura, Katsuyuki: *See*—
Tsuchihashi, Genichi; and Ogura, Katsuyuki, 4,144,248, Cl. 260-332.20A.
Ogura, Yukio; and Ishii, Hisao, to Ricoh Company, Ltd. Scanning light source. 4,143,964, Cl. 355-30.000.
Ohara, Katsunobu: *See*—
Ando, Yujiro; Ishihara, Shunichi; Murakawa, Shuji; and Ohara, Katsunobu, 4,143,965, Cl. 355-35.00C.
Ohara, Kazuo: *See*—
Murakami, Noboru; Hirosawa, Koichiro; Ohara, Kazuo; and Matsuo, Koichi, 4,143,562, Cl. 74-753.000.
Ohashi, Tamaki, to Nihon Technical Kabushiki Kaisha. Dual band pushbutton tuner. 4,143,555, Cl. 74-10.330.
Ohno, Hideshi, to Citizen Watch Co. Ltd. Electronic circuit block. 4,143,508, Cl. 58-23.00R.
Ohnsorg, Roger W., to Carborundum Company, The. Composition and process for injection molding ceramic materials. 4,144,207, Cl. 260-23.00S.
Oka, Hiroyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Friction-pad wear warning device for use in disc brake. 4,143,744, Cl. 188-1.00A.
Okamoto, Hiroshi; and Matsui, Shigetomo, to Kawasaki Jukogyo Kabushiki Kaisha. Method of correcting rotational speed of screw propeller. 4,143,536, Cl. 72-342.000.
Okamoto, Kazuo: *See*—
Yamanaka, Keio; Okamoto, Kazuo; and Mizukami, Yoshikatsu, 4,144,225, Cl. 260-45.9NC.
Okano, Takeshi; Wada, Naoto; and Kobayashi, Yoshimitsu, to Mitsubishi Chemical Industries Limited. Process for producing alkylene glycol esters. 4,144,396, Cl. 560-246.000.
Okawara, Yasuo: *See*—
Kurihara, Tohio; Mizutani, Nagao; Okawara, Yasuo; Nojima, Masamitsu; and Kunita, Masao, 4,143,977, Cl. 400-56.000.
Okazaki, Shinichiro: *See*—
Numata, Saburo; and Okazaki, Shinichiro, 4,143,954, Cl. 354-23.00D.
O'Keefe, Michael, to S. R. Gent and Company Limited. Adjustable guide devices. 4,143,604, Cl. 112-152.000.
Oki, Toshikazu: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Naganawa, Hiroshi; Ishizuka, Masaaki, all of; Shibamoto, Norio; Oki, Toshikazu; and Inui, Taiji, 4,144,329, Cl. 424-181.000.
Okie, James P.; and Worrall, James D., to Engineered Yarns, Inc. Flattened and bonded fabric of foamed vinyl plastisol on a filament core and method of preparing same. 4,144,371, Cl. 428-255.000.
Okita, Taisuke: *See*—
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Okuda, Hironori: *See*—
Miyashita, Kunio; Okuda, Hironori; Yamashita, Seizi; and Tanabe, Shoji, 4,144,469, Cl. 310-156.000.
Okumura, Yoshio; Tachibana, Kyozo; Sato, Hiroshi; and Matsumoto, Genichi, to Hitachi, Ltd. Power converter control system. 4,144,559, Cl. 363-88.000.
Olin Corporation: *See*—
Dever, Gerald V., Jr., 4,144,295, Cl. 264-40.200.
Oliva, Klaus: *See*—
Noack, Christian; Oliva, Klaus; Eistert, Theodor; Zumpf, Bernd; Spaida, Hans P.; John, Gunter; Pietschmann, Frank; Boltizar, Pal; Fabry, Istvan; Vida, Csongor; Lakos, Lajos; and Klement, Matyas, 4,143,504, Cl. 56-98.000.
Oliveau, Olivier: *See*—
Blanc, Claude; Chenard, Jean-Yves; and Oliveau, Olivier, 4,144,039, Cl. 55-73.000.
Oliver, John F. Automatic fireplace heating system. 4,143,817, Cl. 237-51.000.
Oliver, Richard C. Electronic sound generating system for a stringed musical instrument. 4,143,575, Cl. 84-1.160.
Olson, Rodney I.; and Szegedi, Nicholas J., to Fiber-Dyne, Inc. Ducting fire protection. 4,143,670, Cl. 137-72.000.
Olson, Rodney I., to Fiber-Dyne, Inc. Ducting fire protection. 4,143,671, Cl. 137-72.000.
Olympus Optical Company Limited: *See*—
Matsuyama, Takashi; Tsuda, Hiroshi; and Kasuga, Muneo, 4,143,963, Cl. 355-14.000.
Onda, Eiichi: *See*—
Nemoto, Ichiro; Nakagawa, Tadashi; Watanabe, Masanori; Koyama, Mitsuo; and Onda, Eiichi, 4,143,957, Cl. 354-266.000.
Onda, Mitsuo: *See*—
Nakajima, Fumio; Nikaido, Akira; Onda, Mitsuo; Machida, Takayasu; and Toida, Takashi, 4,144,467, Cl. 310-49.00R.
O'Neill, John F., to Bell Telephone Laboratories, Incorporated. Cascadable analog to digital converter. 4,144,525, Cl. 340-347.0AD.
O'Neill, Padraic S.: *See*—
Worthington, Ralph E.; O'Neill, Padraic S.; and Hackett, Paul F. X., 4,144,315, Cl. 423-490.000.
Onitsuka, Nobuyuki, to Kabushiki Kaisha Honda Rokku. Indicating apparatus in centrifugal force type meter. 4,143,551, Cl. 73-535.000.
Onizawa, Masao, to Sanyo Trading Co., Ltd. Curable compositions containing chloroprene rubber. 4,144,389, Cl. 526-47.800.
Oohama, Tadashi: *See*—
Imai, Haruo; Oohama, Tadashi; Yamaguchi, Ryozo; and Ninomiya, Kunihiro, 4,144,254, Cl. 260-397.400.
Oostenbrink, Albertus A.: *See*—
Nicholas, Terry G.; and Oostenbrink, Albertus A., 4,143,884, Cl. 277-207.00A.
Ooyama, Mitsuhiro: *See*—
Soeda, Katsuji; Sakuma, Fumio; and Ooyama, Mitsuhiro, 4,143,605, Cl. 112-158.00E.
Oronzio de Nora Impianti Elettrochimici S.p.A.: *See*—
Giuffre, Luigi; de Nora, Vittorio; and Spaziante, Placido, 4,144,227, Cl. 526-40.000.
Ortho Pharmaceutical Corporation: *See*—
Holmes, Gordon W., 4,143,656, Cl. 128-130.000.
Osaka, Yoshio: *See*—
Miyakawa, Tadashi; Nakane, Masayoshi; Watanabe, Masafumi; and Osaka, Yoshio, 4,144,587, Cl. 365-94.000.
Oshima, Shintaro; and Sato, Akira, to Kokusai Denshin Denwa Kabushiki Kaisha. Echo cancelling system. 4,144,417, Cl. 179-170.200.
Oshinsky, Frank W.; and Brown, Thomas R., Sr., to McConway & Torley Corporation. Core assembly in a coupler for a railway vehicle. 4,143,701, Cl. 164-368.000.
Osterkorn, Charles L.: *See*—
La Porte, Gerald E.; Osterkorn, Charles L.; and Marino, Salvatore M., 4,143,710, Cl. 165-182.000.
Osterloh, Rolf: *See*—
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Ostermayer, Franz: *See*—
Eichenberger, Kurt; Kuhnis, Hans; Ostermayer, Franz; and Schroter, Herbert, 4,144,344, Cl. 424-267.000.
Oswald, Alexis A.: *See*—
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Otis Engineering Corporation: *See—*
James, Henry J.; and Young, Carter R., 4,143,712, Cl. 166-72.000.
Otouma, Takashi; Asaumi, Hiroshi; Kubota, Kazuo; and Yamamoto, Mitsuo, to Nippon Asbestos Co., Ltd. Method for producing asbestos-free calcium silicate board and the board produced thereby. 4,144,121, Cl. 162-145.000.
Otsu, Mitsuo: *See—*
Nagasaki, Tadashi; Akatsu, Mitsuharu; and Otsu, Mitsuo, 4,144,480, Cl. 315-411.000.
Otsuka, Shinya: *See—*
Ueno, Hiroshi; Tsurumaru, Michiko; Otsuka, Shinya; Matsubayashi, Hiroshi; Aizawa, Masanori; Sano, Hiroki; and Suzuki, Yukio, 4,143,790, Cl. 220-458.000.
Otten, David M., to International Totalizing System. Totalizer for vending machine. 4,143,749, Cl. 194-1.00N.
Owens-Corning Fiberglas Corporation: *See—*
Cottrell, Walter D., Jr.; and Jutte, Ralph B., Jr., 4,144,305, Cl. 264-247.000.
Haynes, Eugene M., 4,143,708, Cl. 165-76.000.
Pierce, Richard H.; and Eisenberg, Arnold J., 4,143,506, Cl. 57-22.000.
Poulsen, Peder U., 4,143,774, Cl. 414-745.000.
Russell, Robert G., 4,144,044, Cl. 65-2.000.
Seymour, Merritt W.; and Jones, James E., 4,143,429, Cl. 4-170.000.
Owens-Illinois, Inc.: *See—*
Ernsthausen, Roger E., 4,144,375, Cl. 428-336.000.
Lee, Soo-Il, 4,144,298, Cl. 264-532.000.
Oxenham, John, to Blackman Martin Group Limited. Assemblies for workpiece positioning. 4,143,571, Cl. 83-412.000.
Oxy Metal Industries Corporation: *See—*
Neumann, John W., 4,144,021, Cl. 432-58.000.
Ozaki, Masamichi: *See—*
Takahashi, Toshiro; Ikegaya, Masashi; and Ozaki, Masamichi, 4,144,142, Cl. 204-58.000.
Ozkan, Mulayim: *See—*
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Pako Corporation: *See—*
Laciak, Francis M.; and Strunc, Gerald R., 4,143,566, Cl. 83-42.000.
Palacio, Gerard: *See—*
Marjollet, Jacques; Palacio, Gerard; and Tondeur, Gerard, 4,143,619, Cl. 122-483.000.
Panetta, Patrick F.: *See—*
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Pano, Benjamin V.; and Gandbhir, Sharad S., to Stone & Webster Engineering Corporation. Process for the production of ethylene. 4,143,521, Cl. 62-101.000.
Papanu, Victor D.: *See—*
Crutchfield, Marvin M.; Papanu, Victor D.; and Warren, Craig B., 4,144,226, Cl. 528-231.000.
Paradis, Joseph R. Positionable cleats and associated conveyors. 4,143,759, Cl. 198-688.000.
Parke, Davis & Company: *See—*
L'Italien, Yvon J., 4,144,246, Cl. 260-326.430.
Parker, Glenn T.: *See—*
Smith, Jon D.; and Parker, Glenn T., 4,143,581, Cl. 85-80.000.
Parker-Hannifin Corporation: *See—*
Krause, Walter O., 4,144,171, Cl. 210-496.000.
Partridge, Gordon: *See—*
Adams, Lionel B.; Fydelor, Peter J.; Partridge, Gordon; and Pithouse, Kenneth B., 4,144,301, Cl. 264-126.000.
Patel, Bhupendra C., to Kendall Company, The. Catheter. 4,143,651, Cl. 128-349.00B.
Paterson, Alan F.: *See—*
Paterson, Roy A.; and Paterson, Alan F., 4,143,869, Cl. 269-166.000.
Paterson, Donald M., deceased; and by Gow, Ian R. E., executor. Washing trays. 4,143,976, Cl. 366-165.000.
Paterson, Roy A.; and Paterson, Alan F. Adjustment clamp. 4,143,869, Cl. 269-166.000.
Patil, Ram S.; and Polakowski, John N., to Inland Steel Company. Drawing quality hot-dip coated steel strip. 4,144,379, Cl. 428-653.000.
Paton, Anthony D.: *See—*
Temple, Stephen; and Paton, Anthony D., 4,143,685, Cl. 139-456.000.
Patton, Tad L., to Exxon Research & Engineering Co. Stabilization of organic amide solvents and polymer solutions thereof. 4,144,213, Cl. 260-30.200.
Paul, William A. Docking apparatus. 4,143,613, Cl. 114-230.000.
Pavlich, Joseph P., to Dow Chemical Company, The. Method for bringing a well under control. 4,143,715, Cl. 166-271.000.
Pawelletz, Reinhard; and Schneider, Heinz, to Mannesmann Aktiengesellschaft. Method of magnetically testing tubes during welding wherein the same magnetic field is used both for heating and testing. 4,144,494, Cl. 324-220.000.
Paynter, Alan H., to Controlex Corporation of America. Push-pull control with spring-loaded seal. 4,143,883, Cl. 277-164.000.
Peck, Gordon H., to Autotronic Controls Corporation. Crankshaft trigger wheel. 4,143,633, Cl. 123-148.00E.
Peilet, Lester R. Retractable dispensing brushes. 4,143,667, Cl. 401-28.000.
Pengue, Leonard M.: *See—*
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Pennwalt Corporation: *See—*
Miano, Jeffrey D., 4,144,288, Cl. 260-880.00R.
Pensack, Joseph M., to American Cyanamid Company. Novel method for the enhancement of wool growth employing certain urea derivatives. 4,144,350, Cl. 424-275.000.
Performance Industries, Inc.: *See—*
Boyesen, Eyvind, 4,143,626, Cl. 123-73.00A.
Perkins, Neale A., to Safariland Ltd. Inc. Safety straps for holsters. 4,143,798, Cl. 224-243.000.
Perkins, Norman P.: *See—*
Shaffer, Howard R.; Heberlein, G. Erich, Jr.; and Perkins, Norman P., 4,144,513, Cl. 335-46.000.
Perry, Richard M.: *See—*
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Pessolano, Arsenio A.: *See—*
Clark, Robert L.; Pessolano, Arsenio A.; and Shen, Tsung-Ying, 4,144,341, Cl. 424-256.000.
Peter, Erich: *See—*
Lindenmuller, Walter; and Peter, Erich, 4,143,684, Cl. 139-450.000.
Peterson, Marvin L.; and Oertle, Donald H., to Continental Oil Company. Method of preventing corrosion of joints of steel structures submerged in corrosive media. 4,143,540, Cl. 73-40.000.
Petersson, Stig A.; and Eriksson, Bengt S., to Boliden Aktiebolag. Method of producing blister copper. 4,144,055, Cl. 75-73.000.
Petzoldt, Karl; and Elger, Walter, to Schering Aktiengesellschaft. Novel α-hydroxy steroids. 4,144,334, Cl. 424-243.000.
Pfaff Industriemaschinen GmbH: *See—*
Hager, Walter, 4,143,607, Cl. 112-209.000.
Pfizer Inc.: *See—*
Baxter, Charles A. R.; and Shroot, Braham, 4,144,240, Cl. 260-302.0SD.
Richardson, Kenneth, 4,144,255, Cl. 260-404.500.
Pharney, Julian R., to Bell Telephone Laboratories, Incorporated. Electrical cable fault locating apparatus. 4,144,487, Cl. 324-52.000.
Philip Morris Incorporated: *See—*
Rainer, Norman B.; Hoelzel, Charles B.; and Hopkins, William C., 4,143,666, Cl. 131-2.000.
Phillips Petroleum Company: *See—*
Chapman, Charles C.; and Hann, Paul D., 4,144,281, Cl. 260-683.480.
Fahey, Darryl R.; and Mahan, John E., 4,144,259, Cl. 260-439.00R.
Hutchinson, William M., deceased; and Hutchinson, Florence M., executrix, 4,144,175, Cl. 252-1.000.
Hutchinson, William M., deceased; and Hutchinson, Florence M., executrix, 4,144,187, Cl. 252-364.000.
Strope, Daniel J., 4,144,278, Cl. 260-666.00B.
Walker, Darrell W.; and Farha, Floyd E., Jr., 4,144,277, Cl. 260-666.00A.
Young, Jerry W., 4,143,610, Cl. 113-113.00D.
Phillips, Raymond N. Automatic light switching system. 4,144,420, Cl. 200-51.00R.
Picker Corporation: *See—*
Lutz, Ronald E.; Sokol, Henry R.; and Sorwick, Jack R., 4,144,455, Cl. 250-444.000.
Pielkenrood, Jacob, to Pielkenrood-Vinitex B.V. Device for skimming material floating on a liquid. 4,144,173, Cl. 210-525.000.
Pielkenrood-Vinitex B.V.: *See—*
Pielkenrood, Jacob, 4,144,173, Cl. 210-525.000.
Pierce, Norton T., to Massachusetts Institute of Technology. Venetian-blind solar collector. 4,143,640, Cl. 126-270.000.
Pierce, Richard H.; and Eisenberg, Arnold J., to Owens-Corning Fiberglas Corporation. Method and apparatus for introducing a strand into a continuously advancing roving. 4,143,506, Cl. 57-22.000.
Pietsch, Hanns: *See—*
Guse, Gunter; Lukat, Ernst; Jauchen, Peter; Lenck, Wolfdieter; and Pietsch, Hanns, 4,144,157, Cl. 204-159.230.
Pietschmann, Frank: *See—*
Noack, Christian; Oliva, Klaus; Eistert, Theodor; Zumpf, Bernd; Spaida, Hans P.; John, Gunter; Pietschmann, Frank; Boltizar, Pal; Fabry, Istvan; Vida, Csongor; Lakos, Lajos; and Klement, Matyas, 4,143,504, Cl. 56-98.000.
Pike, Robert H. Foldable tables. 4,143,601, Cl. 108-35.000.
Pilot Man-Nen Hitsu Kabushiki Kaisha: *See—*
Murata, Yasuzo; Yokoyama, Takeo; and Murata, Hiroshi, 4,143,472, Cl. 35-66.000.
Pils, Walter: *See—*
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Pinkley, Paul D. Material hopper translatable unit. 4,144,012, Cl. 425-225.000.
Pioneer Electronic Corporation: *See—*
Nakazono, Jiro; Kodama, Akihiko; and Tsuchiya, Yukio, 4,143,738, Cl. 181-159.000.
Pirck, Dietrich: *See—*
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Pisciotta, Emilio C.; and Thornock, Tony G., to International Business Machines Corporation. Asynchronous validity checking system and method for monitoring clock signals on separate electrical conductors. 4,144,448, Cl. 235-301.000.
Pithouse, Kenneth B.: *See—*
Adams, Lionel B.; Fydelor, Peter J.; Partridge, Gordon; and Pithouse, Kenneth B., 4,144,301, Cl. 264-126.000.
Pitney-Bowes, Inc.: *See—*
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Pizzini, Louis C.: *See—*
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Plakas, Chris J., to Vitatect Corp. Method for detection of bacterial concentration by luminescence. 4,144,134, Cl. 195-103.50M.
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Plourde, Neal N., to General Motors Corporation. Molding clip. 4,143,906, Cl. 296-84.00D.
Plummer, Mark A.; and Schroeder, Donald E., Jr., to Marathon Oil Company. Sulfonation of crude oils to produce petroleum sulfonates. 4,144,266, Cl. 260-505.00S.
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Zitting, Gordon T., 4,143,586, Cl. 92-206.000.
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Powell, Kenneth E., to International Business Machines Corporation. Remote card operated terminal extensor circuitry. 4,144,584, Cl. 364-900.000.
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Press, Louis H. Method of making decorative ring links and article produced thereby. 4,143,894, Cl. 289-1.200.
Preston Engravers, Inc.: *See—*
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Preuss, Heinz, to BTS - Systemtwicklungs GmbH. Audio-visual reproduction device. 4,144,542, Cl. 358-9.000.
Prickett, Michael J.; and Humpherys, Bernarr H., to United States of America, Navy. Battlefield IFF system. 4,144,534, Cl. 343-6.5LC.
Probe-Rite, Inc.: *See—*
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Provost, Richard L., to Du Pont de Nemours, E. I., and Company. Dyeing of high strength, high modules aromatic polyamide fibers. 4,144,023, Cl. 8-17.000.
Prudente, Andrew. Audio signal processor. 4,144,581, Cl. 364-827.000.
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Puchalska-Hibner, Irena, to United States of America, Air Force. Bubble domain structures and method of making. 4,144,585, Cl. 365-3.000.
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Pyatnitskaya, Irina N.; Ivanov, Vladimir I.; Borovkova, Nina K.; and Naidenova, Nina G. Medical preparation for treatment of alcoholism. 4,144,348, Cl. 424-274.000.
Q. V. Sales Limited: *See—*
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Quanbeck, Sherman H. Earth working tool and support assembly therefor. 4,143,718, Cl. 172-705.000.
Quermann, Thomas R., to Sperry Rand Corporation. Free floating gyroscopic compass azimuth pick-off and rotor drive system. 4,143,466, Cl. 33-327.000.
Radimer, Kenneth J.; and McCarthy, Michael J., to FMC Corporation. Electrolytic production of sodium persulfate. 4,144,144, Cl. 204-82.000.
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Rahn, Martin; Reh, Lothar; Thone, Bernd; and Vydra, Karel, to Metallgesellschaft Aktiengesellschaft; and Deutsche Babcock Aktiengesellschaft. Process for thermally treating solids with high-oxygen gases, especially for pyrometallurgical applications. 4,144,051, Cl. 75-9.000.
Rainer, Norman B.; Hoelzel, Charles B.; and Hopkins, William C., to Philip Morris Incorporated. Smoking material. 4,143,666, Cl. 131-2.000.
Rambosek, G. Phillip; and Thiel, Charles G., to Minnesota Mining and Manufacturing Company. Intratracheal injection system for animals. 4,143,658, Cl. 128-184.000.
Ramos, Orfelio. Tilt actuated circuit breaker. 4,144,422, Cl. 200-61.520.
Ranco Incorporated: *See—*
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Rao, Babu Y.; Herbstman, Sheldon; and Riordan, Michael D., to Texaco Inc. Recovery of ethers. 4,144,138, Cl. 203-46.000.
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Rawlings, Robert M.; and Procter, Donald, to Blue Wing Corporation. Method for separating vegetable waste solids from aqueous slurries of vegetable waste materials and method of feeding the separated solids to ruminant animals. 4,144,355, Cl. 426-2.000.
Rawson, Eric G., to Xerox Corporation. Rear projection screen system. 4,143,943, Cl. 350-120.000.
Ray, Martyn S.: *See—*
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Fernsler, Ronald E.; and Henley, Michael L., 4,144,545, Cl. 358-158.000.

Otis Engineering Corporation: *See*—
James, Henry J.; and Young, Carter R., 4,143,712, Cl. 166-72.000.
Otouma, Takashi; Asaumi, Hiroshi; Kubota, Kazuo; and Yamamoto, Mitsuo, to Nippon Asbestos Co., Ltd. Method for producing asbestos-free calcium silicate board and the board produced thereby. 4,144,121, Cl. 162-145.000.
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Otten, David M., to International Totalizing System. Totalizer for vending machine. 4,143,749, Cl. 194-1.00N.
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Paterson, Donald M., deceased; and by Gow, Ian R. E., executor. Washing trays. 4,143,976, Cl. 366-165.000.
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Patil, Ram S.; and Polakowski, John N., to Inland Steel Company. Drawing quality hot-dip coated steel strip. 4,144,379, Cl. 428-653.000.
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Paul, William A. Docking apparatus. 4,143,613, Cl. 114-230.000.
Pavlich, Joseph P., to Dow Chemical Company, The. Method for bringing a well under control. 4,143,715, Cl. 166-271.000.
Paweletz, Reinhard; and Schneider, Heinz, to Mannesmann Aktiengesellschaft. Method of magnetically testing tubes during welding wherein the same magnetic field is used both for heating and testing. 4,144,494, Cl. 324-220.000.
Paynter, Alan H., to Controlex Corporation of America. Push-pull control with spring-loaded seal. 4,143,883, Cl. 277-164.000.
Peck, Gordon H., to Autotronic Controls Corporation. Crankshaft trigger wheel. 4,143,633, Cl. 123-148.00E.
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Perkins, Neale A., to Safariland Ltd. Inc. Safety straps for holsters. 4,143,798, Cl. 224-243.000.
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Peterson, Marvin L.; and Oertle, Donald H., to Continental Oil Company. Method of preventing corrosion of joints of steel structures submerged in corrosive media. 4,143,540, Cl. 73-40.000.
Petersson, Stig A.; and Eriksson, Bengt S., to Boliden Aktiebolag. Method of producing blister copper. 4,144,055, Cl. 75-73.000.
Petzoldt, Karl; and Elger, Walter, to Schering Aktiengesellschaft. Novel α-hydroxy steroids. 4,144,334, Cl. 424-243.000.
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Hutchinson, William M., deceased; and Hutchinson, Florence M., executrix, 4,144,187, Cl. 252-364.000.
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Walker, Darrell W.; and Farha, Floyd E., Jr., 4,144,277, Cl. 260-666.00A.
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Pielkenrood, Jacob, to Pielkenrood-Vinitex B.V. Device for skimming material floating on a liquid. 4,144,173, Cl. 210-525.000.
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Pierce, Norton T., to Massachusetts Institute of Technology. Venetian-blind solar collector. 4,143,640, Cl. 126-270.000.
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Pisciotta, Emilio C.; and Thornock, Tony G., to International Business Machines Corporation. Asynchronous validity checking system and method for monitoring clock signals on separate electrical conductors. 4,144,448, Cl. 235-301.000.
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Pitney-Bowes, Inc.: *See*—
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Pizzini, Louis C.: *See—*
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Platt, Ellis F. Thread dispenser. 4,143,832, Cl. 242-129.620.
Play-Rite Music Rolls, Inc.: *See—*
Ravn, Mogens, 4,143,807, Cl. 234-3.000.
Pleschiutschnigg, Fritz-Peter: *See—*
Schrewe, Hans; and Pleschiutschnigg, Fritz-Peter, 4,143,866, Cl. 266-216.000.
Plessey Handel und Investments AG: *See—*
Lewis, Brian; and Deacon, John M., 4,144,508, Cl. 333-191.000.
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Pliskanovsky, Stanislav T.: *See—*
Nemtsov, Nikolai S.; Vasiliev, Viktor I.; Tarasov, Vladimir P.; Pliskanovsky, Stanislav T.; Shokul, Anatoly A.; Kravchenko, Anatoly P.; Kraizinger, Fedor V.; and Krjukov, Ivan I., 4,143,777, Cl. 414-170.000.
Plourde, Neal N., to General Motors Corporation. Molding clip. 4,143,906, Cl. 296-84.00D.
Plummer, Mark A.; and Schroeder, Donald E., Jr., to Marathon Oil Company. Sulfonation of crude oils to produce petroleum sulfonates. 4,144,266, Cl. 260-505.00S.
Pneumo Corporation: *See—*
Bauer, Dan O.; and Heintz, Richard P., 4,143,583, Cl. 91-1.000.
Pociask, Michael J.: *See—*
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Polak, Lev S.: *See—*
Dementiev, Valentin V.; Zhidovich, Anatoly I.; Mosse, Alfred L.; Yasko, Oleg I.; Polak, Lev S.; Gulyaev, Genrikh V.; Levenzon, Rafail I.; Volodin, Nikolai L.; Vurzel, Filipp B.; and Laktjushin, Alexandr N., 4,144,444, Cl. 219-383.000.
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Polaroid Corporation: *See—*
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Lambert, Ronald F.; and Schreiber, Karl J., 4,144,065, Cl. 96-29.00D.
Swank, Thomas F., 4,144,025, Cl. 8-79.000.
Polk, Donald E.: *See—*
Chen, Ho-Sou; and Polk, Donald E., 4,144,058, Cl. 75-170.000.
Poly-Seal: *See—*
Zitting, Gordon T., 4,143,586, Cl. 92-206.000.
Polysar Limited: *See—*
Kent, Eric G., 4,144,223, Cl. 260-42.470.
Pont-a-Mousson S.A.: *See—*
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Pope, Anthony M. S.: *See—*
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Portalier, Robert, to Societe de Vente de l'Aluminium Pechiney. Valve for continuously and automatically supplying furnaces with molten metal. 4,143,674, Cl. 137-151.000.
Portner, Peer M.: *See—*
LaForge, David H.; and Portner, Peer M., 4,143,661, Cl. 128-419.00R.
Poulsen, Peder U., to Owens-Corning Fiberglas Corporation. Truck for internally supporting and transporting plastic pipe from a pipe making machine. 4,143,774, Cl. 414-745.000.
Powell, Kenneth E., to International Business Machines Corporation. Remote card operated terminal extensor circuitry. 4,144,584, Cl. 364-900.000.
Powers, Robert J.: *See—*
Kamstra, Gordon E.; and Powers, Robert J., 4,143,638, Cl. 126-121.000.
PPG Industries, Inc.: *See—*
Bosso, Joseph F.; and Castellucci, Nicholas T., 4,144,159, Cl. 204-181.00C.
Ernsberger, Fred M., 4,144,066, Cl. 96-35.100.
Franz, Helmut, 4,144,090, Cl. 134-3.000.
Reinhardt, Arthur E., III, 4,144,192, Cl. 252-438.000.
Starr, Eugene W., 4,144,045, Cl. 65-107.000.
Stevens, Henry C., 4,144,262, Cl. 260-463.000.
Prather, Richard A., to Rosetti Contracting Company. Adjustable brace. 4,143,989, Cl. 404-72.000.
Prechtl, Alfred: *See—*
Burger, Manfred R.; Gagel, Ernst; Kalmovicz, Rudolf; and Prechtl, Alfred, 4,143,523, Cl. 62-324.000.
Press, Jeffery B.; and Safir, Sidney R., to American Cyanamid Company. Thieno[3,4-b][1,5]benzoxazepin-10-ones and thieno[3,4-b][1,5]benzothiazepin-10-ones. 4,144,235, Cl. 260-239.30T.
Press, Louis H. Method of making decorative ring links and article produced thereby. 4,143,894, Cl. 289-1.200.
Preston Engravers, Inc.: *See—*
Kesten, Martin; and Tevald, Frank W., 4,143,597, Cl. 101-378.000.
Preuss, Heinz, to BTS - Systemtwicklungs GmbH. Audio-visual reproduction device. 4,144,542, Cl. 358-9.000.
Prickett, Michael J.; and Humpherys, Bernarr H., to United States of America, Navy. Battlefield IFF system. 4,144,534, Cl. 343-6.5LC.
Probe-Rite, Inc.: *See—*
Ardezzone, Frank J.; and Verhoeven, Arthur P., 4,144,536, Cl. 346-33.00F.
Procter, Donald: *See—*
Rawlings, Robert M.; and Procter, Donald, 4,144,355, Cl. 426-2.000.
Procter & Gamble Company, The: *See—*
Clark, Clarence O.; DeAngelis, Robert L.; Deffren, Kenneth F.; Flautt, Thomas J.; Hofmann, Erwin A.; and Weinshenker, Eugene, 4,144,435, Cl. 219-10.55E.
Gelman, Stephanie S.; Maguire, Edward J., Jr.; and Guilloty, Haydee R., 4,144,438, Cl. 219-10.55E.
Reed, Richard B., 4,143,797, Cl. 222-207.000.
Prohaska, Hans: *See—*
Ade, Rolf; Prohaska, Hans; and Schmid, Eckhardt, 4,143,488, Cl. 417-366.000.
Proudian, Andrew P.: *See—*
Nagy, Art; and Proudian, Andrew P., 4,143,554, Cl. 73-641.000.
Provost, Richard L., to Du Pont de Nemours, E. I., and Company. Dyeing of high strength, high modules aromatic polyamide fibers. 4,144,023, Cl. 8-17.000.
Prudente, Andrew. Audio signal processor. 4,144,581, Cl. 364-827.000.
Pryor, Robert A.: *See—*
Coleman, Michael G.; Grenon, Lawrence A.; Pryor, Robert A.; and Restrepo, Fabio, 4,144,094, Cl. 136-89.0CC.
Puchalska-Hibner, Irena, to United States of America, Air Force. Bubble domain structures and method of making. 4,144,585, Cl. 365-3.000.
Puckette, Charles M.: *See—*
Butler, Walter J.; and Puckette, Charles M., 4,144,527, Cl. 340-347.0AD.
Pullman Incorporated: *See—*
Keller, Norman L., 4,143,755, Cl. 198-456.000.
Nagy, Ernest J., 4,143,615, Cl. 116-46.000.
Purvis, Fay A.: *See—*
Gagliardo, John P.; and Purvis, Fay A., 4,143,717, Cl. 169-15.000.
Putter, Irving, to Merck & Co., Inc. Milbemycin compounds as anthelmintic agents. 4,144,352, Cl. 424-279.000.
Pyatnitskaya, Irina N.; Ivanov, Vladimir I.; Borovkova, Nina K.; and Naidenova, Nina G. Medical preparation for treatment of alcoholism. 4,144,348, Cl. 424-274.000.
Q. V. Sales Limited: *See—*
Wetherall, Henry E.; and Mount Hill, Edith K., 4,143,899, Cl. 294-50.900.
Quanbeck, Sherman H. Earth working tool and support assembly therefor. 4,143,718, Cl. 172-705.000.
Quermann, Thomas R., to Sperry Rand Corporation. Free floating gyroscopic compass azimuth pick-off and rotor drive system. 4,143,466, Cl. 33-327.000.
Radimer, Kenneth J.; and McCarthy, Michael J., to FMC Corporation. Electrolytic production of sodium persulfate. 4,144,144, Cl. 204-82.000.
Radutsky, Grigory A.: *See—*
Voloshin, Rafail Y.; Grachev, Leonid P.; Radutsky, Grigory A.; and Kheifets, Rafail E., 4,143,870, Cl. 270-47.000.
Rahn, Martin; Reh, Lothar; Thone, Bernd; and Vydra, Karel, to Metallgesellschaft Aktiengesellschaft; and Deutsche Babcock Aktiengesellschaft. Process for thermally treating solids with high-oxygen gases, especially for pyrometallurgical applications. 4,144,051, Cl. 75-9.000.
Rainer, Norman B.; Hoelzel, Charles B.; and Hopkins, William C., to Philip Morris Incorporated. Smoking material. 4,143,666, Cl. 131-2.000.
Rambosek, G. Phillip; and Thiel, Charles G., to Minnesota Mining and Manufacturing Company. Intratracheal injection system for animals. 4,143,658, Cl. 128-184.000.
Ramos, Orfelio. Tilt actuated circuit breaker. 4,144,422, Cl. 200-61.520.
Ranco Incorporated: *See—*
Bergmann, Richard L., 4,144,515, Cl. 337-319.000.
Rao, Babu Y.; Herbstman, Sheldon; and Riordan, Michael D., to Texaco Inc. Recovery of ethers. 4,144,138, Cl. 203-46.000.
Rathbone, Ronald: *See—*
Schwabe, Ulrich; and Rathbone, Ronald, 4,143,455, Cl. 29-571.000.
Rauffer, Walter, to Agfa-Gevaert AG. Microfilm reader. 4,143,953, Cl. 353-27.00R.
Ravn, Mogens, to Play-Rite Music Rolls, Inc. Music roll perforating process and apparatus. 4,143,807, Cl. 234-3.000.
Rawlings, Robert M.; and Procter, Donald, to Blue Wing Corporation. Method for separating vegetable waste solids from aqueous slurries of vegetable waste materials and method of feeding the separated solids to ruminant animals. 4,144,355, Cl. 426-2.000.
Rawson, Eric G., to Xerox Corporation. Rear projection screen system. 4,143,943, Cl. 350-120.000.
Ray, Martyn S.: *See—*
Armond, John W.; and Ray, Martyn S., 4,144,037, Cl. 55-58.000.
Raychem Corporation: *See—*
Brooks, Peter L., 4,144,104, Cl. 148-11.50R.
Raytheon Company: *See—*
Hutcheon, Robert S., 4,144,491, Cl. 324-82.000.
Youngren, Fred R., 4,143,617, Cl. 73-358.000.
RCA Corporation: *See—*
Fernsler, Ronald E., 4,144,544, Cl. 358-158.000.
Fernsler, Ronald E.; and Henley, Michael L., 4,144,545, Cl. 358-158.000.

Nossen, Edward J.; and Starner, Eugene R., 4,144,579, Cl. 364-607.000.
Starner, Eugene R.; and Nossen, Edward J., 4,144,572, Cl. 364-487.000.

Redfern, John T., to United States of America, Navy. Combined intrusion sensor line. 4,144,530, Cl. 340-566.000.

Redon Trust: *See—*
Marer, Joseph G., 4,143,598, Cl. 102-8.000.

Redpath Dorman Long Limited: *See—*
Wass, Brian J., 4,144,369, Cl. 428-183.000.

Reed, Richard B., to Procter & Gamble Company, The. Metering dispenser with child resistant, tightly sealing closure. 4,143,797, Cl. 222-207.000.

Reeves, James W.: *See—*
Haack, David J.; and Reeves, James W., 4,144,316, Cl. 423-502.000.

Regis Belt Maintenance Corporation: *See—*
Larson, Robert L., 4,143,565, Cl. 83-4.000.

Reh, Lothar: *See—*
Rahn, Martin; Reh, Lothar; Thone, Bernd; and Vydra, Karel, 4,144,051, Cl. 75-9.000.

Reichert, Leonard K. Electrically conductive cutting block. 4,143,573, Cl. 83-658.000.

Reinhardt, Arthur E., III, to PPG Industries, Inc. Dehydrochlorination catalyst. 4,144,192, Cl. 252-438.000.

Reinwald, Elmar; Schwuger, Milan J.; Smolka, Heinz; and Krings, Peter, to Henkel Kommanditgesellschaft auf Aktien. Process for machine washing of soiled articles using a water-insoluble cation-exchange polymer. 4,144,093, Cl. 134-13.000.

Reneau, Dale M., to General Motors Corporation. Electrohydraulic servo actuator with centering control. 4,143,584, Cl. 91-172.000.

Renner, Johann: *See—*
Fiege, Helmut; Haydn, Josef; Renner, Johann; and Wedemeyer, Karlfried, 4,144,400, Cl. 568-788.000.

Renshaw, Robin: *See—*
Chang, Nuke M.; and Renshaw, Robin, 4,144,439, Cl. 219-60.00A.

Repa Feinstanzwerk GmbH: *See—*
Fohl, Artur, 4,144,423, Cl. 200-61.58B.

Repla Designs Limited: *See—*
Booi, Arie, 4,143,493, Cl. 52-127.000.

Republic Steel Corporation: *See—*
Kinzer, William K.; and Kusner, Robert E., 4,144,053, Cl. 75-42.000.

Research Corporation: *See—*
Maan, Shivcharan S., 4,143,486, Cl. 47-58.000.

Restrepo, Fabio: *See—*
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Reusser, Hans: *See—*
Ryser, Urs; Meszaros, Istvan; Graf, Rudolf; and Reusser, Hans, 4,143,574, Cl. 83-698.000.

Revere Corporation of America: *See—*
Jacobson, Walter E., 4,143,727, Cl. 177-211.000.

Rex, Roger F., to Display Corporation International. Automobile windshield washing service unit. 4,143,792, Cl. 221-97.000.

Reyle, John S. Pilot hole door mounting apparatus. 4,143,443, Cl. 16-128.00R.

Reynolds, Henri M. Variable index tab for a file folder. 4,143,477, Cl. 40-359.000.

Rheem Manufacturing Company: *See—*
Wade, Don W., 4,143,789, Cl. 220-323.000.

Rhone-Poulenc Industries: *See—*
Barreau, Michel; Cotrel, Claude; and Jeanmart, Claude, 4,144,339, Cl. 424-251.000.
Semanaz, Daniel; and Mourlan, Jany, 4,144,284, Cl. 260-857.0PA.

Ribatto, Jean-Jacques M. Method for the manufacture of loud speakers. 4,143,537, Cl. 72-356.000.

Ribka, Joachim: *See—*
Bauer, Wolfgang; and Ribka, Joachim, 4,144,230, Cl. 260-157.000.
Bauer, Wolfgang; and Ribka, Joachim, 4,144,231, Cl. 260-157.000.

Rice, George A.: *See—*
Girard, Roland T.; Rice, George A.; and DeTommasi, Arthur N., 4,144,418, Cl. 200-2.000.

Richardson, Kenneth, to Pfizer Inc. Substituted (phenylenedimethylene)diamines. 4,144,255, Cl. 260-404.500.

Richardson, Thomas, to Wisconsin Alumni Research Foundation. Immobilization of enzymes on human tissue or erythrocytes. 4,144,131, Cl. 195-68.000.

Richesson, Maurice A.: *See—*
Lawson, Roger E.; and Richesson, Maurice A., 4,144,583, Cl. 364-900.000.

Richter, Donald W.: *See—*
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Ricoh Company, Ltd.: *See—*
Miyagawa, Fumihiro, 4,143,956, Cl. 354-106.000.
Ogura, Yukio; and Ishii, Hisao, 4,143,964, Cl. 355-30.000.

Rideout, Vincent L., to International Business Machines Corporation. Process for providing self-aligned doping regions by ion-implantation and lift-off. 4,144,101, Cl. 148-1.500.

Rieger, Ulrich, to Messerschmitt-Bolkow-Blohm GmbH. Method and device for spread bombing. 4,143,836, Cl. 244-3.150.

Riesser, Gregor H., to Shell Oil Company. Dehydrogenation catalyst. 4,144,197, Cl. 252-462.000.

Rigny, Paul, to Commissariat a l'Energie Atomique. Method and device for excitation and selective dissociation by absorption of laser light and application to isotopic enrichment. 4,144,453, Cl. 250-423.00P.

Riken Keikinzoku Kogyo Kabushiki Kaisha: *See—*
Takahashi, Toshiro; Ikegaya, Masashi; and Ozaki, Masamichi, 4,144,142, Cl. 204-58.000.

Riker Laboratories, Inc.: *See—*
Stern, Richard M., 4,144,347, Cl. 424-273.00R.

Rinde, John E.; and Perry, Richard M., to General Electric Company. Linear motion, electromagnetic force motor. 4,144,514, Cl. 335-229.000.

Rinn Corporation: *See—*
Norman, Royal L., 4,144,460, Cl. 250-451.000.

Riordan, Michael D.: *See—*
Rao, Babu Y.; Herbstman, Sheldon; and Riordan, Michael D., 4,144,138, Cl. 203-46.000.

Ripple, Jack E., to Chicago and North Western Transportation Co. Apparatus for sorting and separating discrete articles. 4,143,769, Cl. 209-544.000.

Rissel, Eva: *See—*
Birkle, Siegfried; Dotzer, Richard; and Rissel, Eva, 4,144,360, Cl. 427-123.000.

Ritter, Ernst; and Schwartz, Reinhard, to Robert Bosch GmbH. RPM Governor for fuel injection engines. 4,143,634, Cl. 123-179.00L.

Robert Bosch GmbH: *See—*
Klotzner, Winfried; Daumer, Rolf; Busse, Wolfgang; and du Mont, Hans-Christoph, 4,143,622, Cl. 123-32.0EC.
Kulke, Gunter, 4,143,625, Cl. 123-32.00R.
Leiber, Heinz, 4,143,514, Cl. 60-534.000.
Ritter, Ernst; and Schwartz, Reinhard, 4,143,634, Cl. 123-179.00L.
Schnaibel, Eberhard; Junginger, Erich; Linder, Ernst; and Hertfelder, Wilhelm, 4,143,706, Cl. 165-26.000.
Stumpp, Gerhard, 4,143,631, Cl. 123-119.00A.

Robertshaw Controls Company: *See—*
Bible, Harley V., 4,143,616, Cl. 116-266.000.
Brakebill, Harold G., 4,143,850, Cl. 251-28.000.

Robinson, Clayton. Router. 4,143,691, Cl. 144-134.00D.

Rock, Erich; and Mages, Bernhard, to Julius Blum Gesellschaft m.b.H. Adjustable bracket for wall-units. 4,143,846, Cl. 248-360.000.

Rockwell International Corporation: *See—*
Nicholas, David C., 4,144,414, Cl. 179-15.0BS.

Roeder, George K. Aircraft breakaway cabin section. 4,143,841, Cl. 244-140.000.

Roelofs, Hendrik: *See—*
Hasker, Jan; van Ijzendoorn, Petrus R.; and Roelofs, Hendrik, 4,143,447, Cl. 29-25.130.

Roes, John B., to Cubic Western Data. Validator for magnetic tickets. 4,144,548, Cl. 360-59.000.

Roesner, Bruce B., to Hughes Aircraft Company. P+ Buried layer for I^2L isolation by ion implantation. 4,144,098, Cl. 148-1.500.

Rogozhin, Sergei V.: *See—*
Yaroshenko, Jury F.; Gonsales, Rodriges S.; Rogozhin, Sergei V.; and Misjurev, Vladimir I., 4,143,591, Cl. 99-483.000.

Rohm and Haas Company: *See—*
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Rolando, Paul R.: *See—*
Anderson, Andrew W.; and Rolando, Paul R., 4,143,503, Cl. 53-228.000.

Rolles, Joseph P.: *See—*
Breeden, Arnold H., 4,144,300, Cl. 264-106.000.

Rose, Leslie C.: *See—*
Hamrick, Joseph T.; and Rose, Leslie C., 4,143,522, Cl. 62-324.000.

Rosetti Contracting Company: *See—*
Prather, Richard A., 4,143,989, Cl. 404-72.000.

Rosynek, John J., to Continental Group, Inc., The. Child resistant safety closure. 4,143,788, Cl. 220-273.000.

Rounthwaite, Cyril F. T.: *See—*
Creswick, William E.; and Rounthwaite, Cyril F. T., 4,143,703, Cl. 165-1.000.

Rowland, Robert O.: *See—*
Havstad, Harold R.; Ruksenas, Miguel A.; and Rowland, Robert O., 4,143,872, Cl. 272-99.000.

Ruckert, Hans; and Unholz, Rainer, to Hoechst Aktiengesellschaft. Light-sensitive copying material and method for the production of colored relief images. 4,144,067, Cl. 96-36.000.

Ruksenas, Miguel A.: *See—*
Havstad, Harold R.; Ruksenas, Miguel A.; and Rowland, Robert O., 4,143,872, Cl. 272-99.000.

Rumpf, Robert J., to Firestone Tire & Rubber Company, The. Seat back hinge. 4,143,913, Cl. 297-379.000.

Runge, Thomas M. Left atrial to descending thoracic aorta left ventricular assist device. 4,143,425, Cl. 3-1.700.

Russell, Robert G., to Owens-Corning Fiberglas Corporation. Method and apparatus for forming fibers. 4,144,044, Cl. 65-2.000.

Ruthner Industrieanlagen-Aktiengesellschaft: *See—*
Krepler, Albert, 4,144,092, Cl. 134-12.000.

Ryall, Michael L., to Weir Pumps Limited. Fluid machines. 4,143,999, Cl. 417-424.000.

Ryser, Urs; Meszaros, Istvan; Graf, Rudolf; and Reusser, Hans, to Fribosa Ltd. Stamping device for a fineblanking press. 4,143,574, Cl. 83-698.000.

S. C. Johnson & Son, Inc.: *See—*
D'Orazio, Vincent T., 4,144,318, Cl. 424-40.000.

S. R. Gent and Company Limited: *See—*
O'Keefe, Michael, 4,143,604, Cl. 112-152.000.

Sader, Georg; and Pils, Walter, to Hoechst Aktiengesellschaft. Control device and copier. 4,143,968, Cl. 355-83.000.

Safariland Ltd. Inc.: *See—*
Perkins, Neale A., 4,143,798, Cl. 224-243.000.
Safir, Sidney R.: *See—*
Press, Jeffery B.; and Safir, Sidney R., 4,144,235, Cl. 260-239.30T.
Sagami Chemical Research Center: *See—*
Tsuchihashi, Genichi; and Ogura, Katsuyuki, 4,144,248, Cl. 260-332.20A.
Said, Adel, to Lonza, Ltd. Process for the production of pure white 2-chloronicotinic acid. 4,144,238, Cl. 546-318.000.
Saito, Syunji: *See—*
Tadakuma, Yuji; Saito, Syunji; and Eguchi, Toru, 4,144,567, Cl. 364-405.000.
Sakai, Masayasu: *See—*
Takahashi, Yasuro; Yamamoto, Hisao; Sakai, Masayasu; and Takegawa, Toshiyuki, 4,144,016, Cl. 431-8.000.
Sakai, Nobuo: *See—*
Ishibashi, Hiroshi; Sakai, Nobuo; Imai, Kiyoshi; and Nakajima, Junya, 4,144,068, Cl. 96-60.00R.
Sakai, Takao, to Hitachi, Ltd. Hydraulic machine shutdown sensor assembly. 4,144,421, Cl. 200-61.400.
Sakakibara, Yosihiro; and Awano, Takeshi, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Imasen Denki Seisakusho. Seat walk-in device for automobiles. 4,143,911, Cl. 297-341.000.
Sakamoto, Masayuki: *See—*
Utano, Takanori; Sakamoto, Masayuki; and Takayama, Yoshikazu, 4,144,409, Cl. 179-2.0EB.
Sakuma, Fumio: *See—*
Soeda, Katsuji; Sakuma, Fumio; and Ooyama, Mitsuhiro, 4,143,605, Cl. 112-158.00E.
Sakuma, Tadashi, to Kabushiki Kaisha Daini Seikosha. Analogue electronic timepiece with setting means. 4,143,510, Cl. 58-85.500.
Sakura Color Products Corporation: *See—*
Mitsuya, Yoshihide, 4,143,473, Cl. 35-76.000.
Sala Magnetics, Inc.: *See—*
Kolm, Henry H., 4,144,163, Cl. 209-12.000.
Saljuk, Viktor A.: *See—*
Malyshev, Boris N.; Saljuk, Viktor A.; Skobelkin, Oleg K.; Toschakov, Robert A.; Brekhov, Evgeny I.; Egorov, Evgeny I.; and Ivanov, Alexei I., 4,143,660, Cl. 128-303.100.
Salomon, Georges P. J., to Etablissements Francois Salomon et Fils. Safety ski binding. 4,143,886, Cl. 280-624.000.
Salve S.A.: *See—*
Spiegelberg, Hans, 4,143,762, Cl. 206-210.000.
Sampsel, Kenneth E., to Home Metal Products Company a Division of Mobex Corporation. Cooking apparatus and exhaust system. 4,143,646, Cl. 126-299.00D.
Sanders, Lincoln L. Biorhythm calculator. 4,144,446, Cl. 235-85.0FC.
Sandoz Ltd.: *See—*
Bastian, Jean-Michel, 4,144,337, Cl. 424-250.000.
Sanford, Arthur C. End bearing construction for truss. 4,143,500, Cl. 52-693.000.
Sano, Hiroki: *See—*
Ueno, Hiroshi; Tsurumaru, Michiko; Otsuka, Shinya; Matsubayashi, Hiroshi; Aizawa, Masanori; Sano, Hiroki; and Suzuki, Yukio, 4,143,790, Cl. 220-458.000.
Sansui Electric Co., Ltd.: *See—*
Ikeda, Yuji, 4,144,502, Cl. 330-207.00A.
Sugiura, Naokatsu, 4,144,463, Cl. 307-75.000.
Santa Fe International Corp.: *See—*
Chang, Nuke M.; and Renshaw, Robin, 4,144,439, Cl. 219-60.00A.
Sanyei Corporation: *See—*
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Sanyo Electric Co., Ltd: *See—*
Wakebe, Yoshitaka; Matsumoto, Hirofumi; Momohara, Hiedo; Tsuchida, Yasuyuki; and Tomoshige, Kazuhiro, 4,143,557, Cl. 74-217.00B.
Sanyo Trading Co., Ltd.: *See—*
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Sargent, Claud B., to Breston, Michael P., a part interest. Multiple welding head system for fabricating pipe. 4,143,801, Cl. 228-17.500.
Sasaguri, Kiichiro: *See—*
Inoue, Akio; Iwasa, Toshio; Sasaguri, Kiichiro; Amano, Toshihiko; and Nomura, Junji, 4,144,299, Cl. 264-558.000.
Sato, Akira: *See—*
Oshima, Shintaro; and Sato, Akira, 4,144,417, Cl. 179-170.200.
Sato, Atsushi; Shimizu, Isoo; and Matsuzaka, Eiichi, to Nippon Petrochemicals Company, Limited. Aralkylation of alkylbenzenes. 4,144,279, Cl. 260-668.00R.
Sato, Hiroshi: *See—*
Okumura, Yoshio; Tachibana, Kyozo; Sato, Hiroshi; and Matsumoto, Genichi, 4,144,559, Cl. 363-88.000.
Sato, Kozo. Tablet for preventing deterioration of a water-soluble cutting liquid. 4,144,188, Cl. 252-389.00R.
Sato, Toshio: *See—*
Kawanaka, Hideo; Sato, Toshio; and Kasahara, Yosihiko, 4,144,176, Cl. 252-8.700.
Sattmann, Karl. Gas flow controlled furnace flue damper. 4,143,811, Cl. 236-1.00G.
Satya, Akella V.: *See—*
Lee, James H.; Lessmann, Bernd K. S.; and Satya, Akella V., 4,144,493, Cl. 324-158.00R.
Sawamoto, Yuzi: *See—*
Miya, Bunji; Sawamoto, Yuzi; Hashiba, Kunizo; and Hisamitsu, Shizuo, 4,144,198, Cl. 252-466.00J.
Saxon, B. Ronald, to International Telephone & Telegraph Corp. Key telephone system paging lockout circuit. 4,144,415, Cl. 179-99.000.
Scandia Packaging Machinery Company: *See—*
Anderson, Andrew W.; and Rolando, Paul R., 4,143,503, Cl. 53-228.000.
Schadow, Rudolf, to ITT Industries, Inc. Push-button actuated slide switch. 4,144,419, Cl. 200-16.00R.
Schaefer, Donald L.; and Temple, Victor A. K., to Electric Power Research Institute, Inc. Light-activated semiconductor device package unit. 4,144,541, Cl. 357-30.000.
Schaerer, Andre J. Method for manufacturing a resistant plastic pipe. 4,144,111, Cl. 156-187.000.
Schalch, Fred E.; and Szoky, Anton, to Fael SA. Method and apparatus for controlling welding operations during resistance welding. 4,144,440, Cl. 219-61.500.
Scharf, Emil; Fikentscher, Rolf; Auhorn, Werner; and Streit, Werner, to BASF Aktiengesellschaft. Incorporating a crosslinked polyamidoamine condensation product into paper-making pulp. 4,144,123, Cl. 162-164.00R.
Scharlin, John A. Large print books and method for producing the same from regular size books. 4,143,889, Cl. 281-15.00R.
Schauer, Friedrich, to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Swivel connection. 4,143,930, Cl. 339-6.00R.
Schaumburg, Gunter: *See—*
Weber, Gunter; and Schaumburg, Gunter, 4,143,528, Cl. 70-1.500.
Scheidecker, Georges, to Societe Alsacienne de Constructions Mechaniques de Mulhouse. Device for controlling and cutting the weft threads in looms with weft inserters. 4,143,683, Cl. 139-450.000.
Schell, Ralph C., to Caterpillar Tractor Co. Exhaust system for vehicle. 4,143,677, Cl. 137-875.000.
Schellhammer, Carl-Wolfgang: *See—*
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Schering Aktiengesellschaft: *See—*
Petzoldt, Karl; and Elger, Walter, 4,144,334, Cl. 424-243.000.
Schering Corporation: *See—*
Neri, Rudolph O.; and Topliss, John G., 4,144,270, Cl. 260-562.00R.
Schild, Josef, to Ing. Karl Vockenhuber; and Hauser, DDr. Raimund. Camera. 4,143,950, Cl. 352-91.00C.
Schilling, William F.: *See—*
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Schlanger, Samuel L., to Mauer, Gail B.; and Cohen, Ellen R. Anti-nose-dive safety system for a vehicle. 4,143,735, Cl. 180-91.000.
Schlappig, Manfred: *See—*
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Schlatter, James M.: *See—*
Jones, David A., Jr.; and Schlatter, James M., 4,144,228, Cl. 260-112.50R.
Schlauer, Johannes: *See—*
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Schloss, Phillip C.: *See—*
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Schluter, Wilhelm: *See—*
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Schmid, Eckhardt: *See—*
Ade, Rolf; Prohaska, Hans; and Schmid, Eckhardt, 4,143,488, Cl. 417-366.000.
Schmidt, Alfred; and Fritz, Gunther, to Ing. Alfred Schmidt GmbH, Firma. Snow blowers. 4,143,475, Cl. 37-43.00C.
Schmidt, Karl-Walter, to Daimler-Benz Aktiengesellschaft. Spark-ignited reciprocating-piston internal combustion engine. 4,143,624, Cl. 123-32.00B.
Schmidt, Klaus; Graber, Adolf; and Helbeck, Hans U., to Carl Freudenberg, Firma. Apparatus for electrodynamic spraying. 4,144,553, Cl. 361-227.000.
Schmidt, Robert R., III; and Holmes, Jerry D., to Eastman Kodak Company. Substantially amorphous polyolefins useful as pressure-sensitive adhesives. 4,143,858, Cl. 526-48.200.
Schmitt, Ewald: *See—*
Herbener, Klaus; and Schmitt, Ewald, 4,143,860, Cl. 266-49.000.
Schmotzer, Norman H. Carbide tipped drill bit for boring holes in concrete and steel. 4,143,723, Cl. 175-410.000.
Schmude, Leonhard; Hasnay, Luan P.; Amende, Dieter V.; and Lettermann, Peter, to Magirus-Deutz Aktiengesellschaft. Ornamental grill for a motor vehicle body. 4,143,732, Cl. 180-68.00P.
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Serbent, Harry; and Schnabel, Wolfram, 4,144,052, Cl. 75-36.000.
Schnaibel, Eberhard; Junginger, Erich; Linder, Ernst; and Hertfelder, Wilhelm, to Robert Bosch GmbH. Climate control for a motor vehicle compartment. 4,143,706, Cl. 165-26.000.
Schneider, Heinz: *See—*
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Schneider, Horst: *See—*
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Schnell, Karl. Lifting device for feeding a processing machine. 4,143,780, Cl. 414-620.000.
Schoenfeld, Harald: *See—*
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Schonmeier, Herbert, to Jagenberg-Werke AG. Contacting overlapped cutting discs. 4,143,572, Cl. 83-501.000.
Schoofs, Richard J. Adsorbent for use in double glazed windows. 4,144,196, Cl. 252-455.00Z.
Schreiber, Karl J.: *See—*
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Schreiner, Siegfried: *See—*
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Schrewe, Hans; and Pleschiutschnigg, Fritz-Peter, to Mannesmann Aktiengesellschaft. Deoxidizing and/or desulfurizing of steel. 4,143,866, Cl. 266-216.000.
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Schroeder, Larry L.: *See—*
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Schroter, Herbert: *See—*
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Schuchmann, Russell P.: *See—*
Flickinger, Charles E.; and Schuchmann, Russell P., 4,144,410, Cl. 179-15.0AL.
Schumacher, Ignatius: *See—*
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Schumann, Gunter: *See—*
Boje, Jurgen; Bratengeier, Horst; Zaveta, Karel; and Schumann, Gunter, 4,143,929, Cl. 339-5.00M.
Schuster, Hans-Joachim; and Heppner, Klaus-Dieter, to Siemens Aktiengesellschaft. Ammonia free palladium deposition using aminoacetic acid. 4,144,141, Cl. 204-47.000.
Schwab, Christopher M., to Beckman Instruments, Inc. Dynamic brake circuit for motor. 4,144,482, Cl. 318-381.000.
Schwab, Gerhart: *See—*
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Schwabe, Ulrich; and Rathbone, Ronald, to Siemens Aktiengesellschaft. Method of producing a semiconductor component. 4,143,455, Cl. 29-571.000.
Schwartz, Clifford W.: *See—*
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Schwartz, Reinhard: *See—*
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Schwarz, Eckhard C. A., to Biax-Fiberfilm Corporation. Apparatus for stretching a tubularly-formed sheet of thermoplastic material. 4,144,008, Cl. 425-66.000.
Schwarz, Gail B., to Measuregraph Company, The. Apparatus for dispensing fabric from a bolt. 4,144,575, Cl. 364-562.000.
Schwarz, Helmut: *See—*
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Sealed Unit Parts Co., Inc.: *See—*
Ehrens, Henry; Slocum, Charles W.; Mancuso, Anthony; and Weiner, Sidney, 4,143,843, Cl. 248-544.000.
Second Foundation: *See—*
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Seiko Koki Kabushiki Kaisha: *See—*
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Seki, Mitsuaki; and Kishimoto, Jyuji, to Canon Kabushiki Kaisha. Electronic apparatus incorporating a power savings feature. 4,144,580, Cl. 364-707.000.
Sekikawa, Nobuyoshi: *See—*
Ikenoue, Shinpei; Masuda, Takao; and Sekikawa, Nobuyoshi, 4,144,072, Cl. 96-114.100.
Sekiya, Kunihiko: *See—*
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Sekmakas, Kazys, to DeSoto, Inc. High solids coating compositions and production thereof. 4,144,220, Cl. 260-33.20R.
Selden, Peter H.; Albrecht, Wolfgang; and Weissenmayer, Heinz, to BASF Aktiengesellschaft. Apparatus for centering and joining cylindrical wound sections. 4,143,450, Cl. 29-272.000.
Selleslags, Frank: *See—*
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Selsam, Roger L., to Hydroacoustics, Inc. Impact tool. 4,143,585, Cl. 91-276.000.
Semanaz, Daniel; and Mourlan, Jany, to Rhone-Poulenc Industries. Shaped articles of synthetic polymers. 4,144,284, Cl. 260-857.0PA.
Semionics Associates: *See—*
Lamb, Sydney M., 4,144,564, Cl. 364-200.000.
Sequeira, Peter J. L., to MPJ Developments Limited. Spreader device and method of spreading inoculant. 4,144,135, Cl. 195-120.000.
Serbent, Harry; and Schnabel, Wolfram, to Metallgesellschaft Aktiengesellschaft. Process of directly reducing iron-containing oxidic materials. 4,144,052, Cl. 75-36.000.
Seymour, Merritt W.; and Jones, James E., to Owens-Corning Fiberglas Corporation. Vanity and lavatory assembly. 4,143,429, Cl. 4-170.000.
Shackle, Dale R.: *See—*
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Shaffer, Howard R.; Heberlein, G. Erich, Jr.; and Perkins, Norman P., to Gould Inc. Anti-rebound latch for current limiting switches. 4,144,513, Cl. 335-46.000.
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Sharma, Virendra: *See—*
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Sharp, Harold L.: *See—*
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Takeuchi, Hiromitsu, 4,144,106, Cl. 148-175.000.
Shean, Robert W. Chain saw guard. 4,143,460, Cl. 30-382.000.
Sheesley, Donald L.; Eggers, Edward T.; and Campbell, Willis R., to Sperry Rand Corporation. Collection and recycling apparatus for crop material particles in a roll forming machine. 4,143,505, Cl. 56-341.000.
Shell Oil Company: *See—*
Felton, John C.; and Badmin, John S., 4,144,331, Cl. 424-219.000.
Riesser, Gregor H., 4,144,197, Cl. 252-462.000.
Shen, Tsung-Ying; Jones, Howard; and Dorn, Conrad P., to Merck & Co., Inc. 2-Methyl-3-hydroxy-4-alkanoylthiomethyl-5-vinylpyridines. 4,144,342, Cl. 424-263.000.
Shen, Tsung-Ying: *See—*
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Sheng, Ming N.; and Kao, Jar-lin, to Atlantic Richfield Company. Catalyzed decomposition of peroxide intermediates resulting from the autoxidation of acrolein or methacrolein. 4,144,399, Cl. 562-598.000.
Sherman, Ralph R., Jr.: *See—*
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Sherman, Samuel W. Universal short spine board system. 4,143,654, Cl. 128-87.00R.
Shiba, Keisuke; Aono, Toshiaki; Hirose, Takeshi; and Shishido, Tadao, to Fuji Photo Film Co., Ltd. Photographic light-sensitive material. 4,144,071, Cl. 96-74.000.
Shibamoto, Norio: *See—*
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Shiber, Samuel. Motorized skateboard. 4,143,728, Cl. 180-1.00G.
Shibuya, Tsunenori; Ishizuka, Yutaka; and Nakamura, Teruo, to Diesel Kiki Company, Ltd. Rotary compressor. 4,144,002, Cl. 418-76.000.
Shields, Dean W., to Filer and Stowell Company, The. Apparatus for dispatching lumber. 4,143,775, Cl. 414-330.000.
Shih, Arnold: *See—*
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Shikinami, Yasuo; Kimura, Ryuichi; Yoshikawa, Yoshinobu; Iida, Kosuke; and Hata, Kunihiro, to Takiron Co., Ltd. Radiation process for producing 1,2-polybutadiene foamed products. 4,144,153, Cl. 204-159.200.
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Shindo, Yoshio; and Ito, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Hydraulic control system for use in automatic transmission. 4,143,563, Cl. 74-867.000.
Shine, William P.: *See—*
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Shinmi, Hideo; and Hanada, Tsuneo, to Toray Silicone Company, Ltd.

Thermosetting silicone resin molding composition. 4,144,222, Cl. 260-37.0SB.

Shiotani, Tadahiko, to Sanyei Corporation. Vessel and blades for food processor, or the like. 4,143,824, Cl. 241-282.100.

Shishido, Tadao: *See—*
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Shokul, Anatoly A.: *See—*
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Shreve, William R., to Texas Instruments Incorporated. Surface acoustic wave resonator incorporating coupling transducer into reflecting arrays. 4,144,507, Cl. 333-191.000.

Shroot, Braham: *See—*
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Sibalis, Dan. Sequential timing circuitry. 4,144,552, Cl. 361-166.000.

Sickinger, Albert E.; and Lhota, Thomas G., to Hans Sickinger Co. Coil binding machine. 4,143,686, Cl. 140-92.930.

Siebels, Johann, to Volkswagenwerk Aktiengesellschaft. High temperature resistant, heat insulating ceramic material. 4,144,195, Cl. 252-455.00R.

Siebert, Howard L. Socket and plug holder. 4,143,934, Cl. 339-75.00P.

Siemens Aktiengesellschaft: *See—*
Auinger, Herbert, 4,144,470, Cl. 310-198.000.
Birkle, Siegfried; Dotzer, Richard; and Rissel, Eva, 4,144,360, Cl. 427-123.000.
Dotzer, Richard; Hauschildt, Hans-George; and Todt, Enno, deceased, 4,144,140, Cl. 204-14.00N.
Fougman, Arthur, 4,143,445, Cl. 24-68.00R.
Giebler, Fritz; and Hotzel, Oskar, 4,143,980, Cl. 400-322.000.
Goebel, Herbert, 4,144,450, Cl. 250-272.000.
Goettler, Ernst; and Gruter, Otto, 4,144,588, Cl. 365-183.000.
Schuster, Hans-Joachim; and Heppner, Klaus-Dieter, 4,144,141, Cl. 204-47.000.
Schwabe, Ulrich; and Rathbone, Ronald, 4,143,455, Cl. 29-571.000.
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Sieron, Richard L.; Kozek, Edward P.; and Shine, William P., to Dual-Lite, Inc. Emergency lighting fluorescent pack. 4,144,462, Cl. 307-66.000.

Simic, Milutin, to Chevron Research Company. Sulfur plasticizing composition. 4,144,082, Cl. 106-287.240.

Simmons, John B., to Dart Industries Inc. Injection blow molding method and apparatus. 4,144,013, Cl. 425-533.000.

Singer Company, The: *See—*
Coulombe, Lionel J.; and Bruder, Edward A., 4,143,608, Cl. 112-210.000.
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Singh, Anand P., to NRM Corporation. Tire stripping mechanism for dual cavity tire press. 4,144,007, Cl. 425-34.00R.

Sitabkhan, Abdul N., to HTL Industries, Inc. Pressure gauge assembly. 4,143,545, Cl. 73-146.800.

Skaalen, Clifford I., to United States of America, Navy. Pin connection system for elevated causeways. 4,143,440, Cl. 14-77.000.

Skadeland, David A. Fireplace heating system. 4,143,816, Cl. 237-8.00R.

Skarblacka Bil- & Motor AB: *See—*
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Skare, Vern E.; and Sokol, Dana D., to Cir-Kit Concepts, Inc. Flexible conductor strips for miniaturized electrical systems. 4,143,931, Cl. 339-17.00F.

Skinner, Charles E.: *See—*
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Skinner, Robert T. J.: *See—*
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Skousgaard, E. Chris. Water closet. 4,143,433, Cl. 4-354.000.

Sleight, Arthur W.: *See—*
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Slemmons, John W. Art object adjustable mounting assembly. 4,143,848, Cl. 248-489.000.

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Smith, Clark L.: *See—*
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Smith, Darrell F., Jr.; Clatworthy, Edward F.; and Wenschhof, Donald E., Jr., to International Nickel Company, Inc., The. Production of low expansion superalloy products. 4,144,102, Cl. 148-2.000.

Smith, David W.; and Logrando, John C., to Value Engineering Company. Power interrupter device for an electrical distribution system. 4,144,551, Cl. 361-93.000.

Smith, Frederick R., to Avtex Fibers Inc. Rayon fibers containing starch. 4,144,079, Cl. 106-164.000.

Smith, George N.: *See—*
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Smith, Jon D.; and Parker, Glenn T., to Dry Dock Industries, Inc. Anchoring retainer for threaded fasteners. 4,143,581, Cl. 85-80.000.

SmithKline Corporation: *See—*
Berges, David A., 4,144,241, Cl. 260-302.50D.
Hall, Ralph F.; and Huffman, William F., 4,144,333, Cl. 424-244.000.

Smiths Industries Limited: *See—*
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Smolka, Heinz: *See—*
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Smolka, Kurt. Portable wall partition. 4,143,698, Cl. 160-120.000.

Snelgrove, James A.; and Christensen, Donald I., to Monsanto Company. Plasticizer blends for polyvinyl butyral interlayers. 4,144,217, Cl. 260-31.80W.

Societa Italiana Resine S.I.R. S.p.A.: *See—*
Balloni, Riccardo; Buzio, Pierpaolo; and Galli, Vito, 4,144,363, Cl. 427-322.000.

Societe Alsacienne de Constructions Mechaniques de Mulhouse: *See—*
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Societe Anonyme Francaise du Ferodo: *See—*
Jeanson, Rene H.; and Vagner, Daniel, 4,143,614, Cl. 115-41.0HT.

Societe Anonyme Metal Deploye Belge: *See—*
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s.a. Texaco Belgium n.v.: *See—*
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Societe de Vente de l'Aluminium Pechiney: *See—*
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Societe Lignes Telegraphiques et Telephoniques: *See—*
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Societe Nationale Elf Aquitaine (Production): *See—*
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Societe Nouvelle Industrielle & Commerciale d'Applications Mecaniques-S.O.N.I.C.A.M.: *See—*
Sogner, Roger, 4,143,489, Cl. 51-43.000.

Societe Nouvelle Youpa-La: *See—*
Monot, Christian, 4,143,434, Cl. 5-99.00R.

Soeda, Katsuji; Sakuma, Fumio; and Ooyama, Mitsuhiro, to Yamamoto Electric Industrial Co., Ltd. Motor driven sewing machine. 4,143,605, Cl. 112-158.00E.

Sogner, Roger, to Societe Nouvelle Industrielle & Commerciale d'Applications Mecaniques-S.O.N.I.C.A.M. Mould polishing machines. 4,143,489, Cl. 51-43.000.

Soikkanen, Pertti: *See—*
Turunen, Risto; Soikkanen, Pertti; and Koponen, Martti, 4,144,124, Cl. 162-290.000.

Sokol, Dana D.: *See—*
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Sokol, Henry R.: *See—*
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Solarex Corporation: *See—*
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Solex Research Corporation: *See—*
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Dereppe, Michel; and Deryckere, Antoine, 4,144,304, Cl. 264-175.000.
Derroitte, Jean-Louis; and Delbouille, Andre, 4,144,390, Cl. 526-125.000.

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Soref, Richard A., to Sperry Rand Corporation. Low loss optical data terminal device for multimode fiber guide optical communication systems. 4,143,941, Cl. 350-96.160.

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Souza, Anthony J.; and Askins, William E., to Woodstream Corporation. Portable escape ladder. 4,143,741, Cl. 182-198.000.

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Bollhalder, Heinz; and Sova, Vladimir, 4,144,149, Cl. 204-149.000.

Spaida, Hans P.: *See—*
Noack, Christian; Oliva, Klaus; Eistert, Theodor; Zumpf, Bernd; Spaida, Hans P.; John, Gunter; Pietschmann, Frank; Boltizar, Pal; Fabry, Istvan; Vida, Csongor; Lakos, Lajos; and Klement, Matyas, 4,143,504, Cl. 56-98.000.

Spaziante, Placido: *See—*
Giuffre, Luigi; de Nora, Vittorio; and Spaziante, Placido, 4,144,227, Cl. 526-40.000.
Spear, Harry W.; and Coppola, Peter J., to Market Forge, a division of Beatrice Foods Co. Cassette locking device. 4,143,927, Cl. 312-196.000.
Sperry Rand Corporation: *See—*
Erspamer, James R.; Jackson, John R.; Misch, Roger A.; and Waldrop, John L., 4,143,467, Cl. 33-356.000.
Fleming, David L., 4,144,524, Cl. 340-754.000.
Funk, Buddy K.; and Smith, Clark L., 4,144,449, Cl. 250-221.000.
Quermann, Thomas R., 4,143,466, Cl. 33-327.000.
Sheesley, Donald L.; Eggers, Edward T.; and Campbell, Willis R., 4,143,505, Cl. 56-341.000.
Soref, Richard A., 4,143,941, Cl. 350-96.160.
Spiegelberg, Hans, to Salve S.A. Wet-tissue rack. 4,143,762, Cl. 206-210.000.
Spieth, Erich: *See—*
Kaiser, Gerhard; and Spieth, Erich, 4,143,567, Cl. 83-113.000.
Spisiak, Juraj: *See—*
Jansa, Milos; Spisiak, Juraj; and Ferdus, Stanislav, 4,143,682, Cl. 139-435.000.
Sponaugle, Lloyd B., to NRM Corporation. Feedblock and die assembly. 4,144,011, Cl. 425-192.00R.
Square D Company: *See—*
Erickson, Kenneth W., 4,144,554, Cl. 361-355.000.
Stach, Wolfgang: *See—*
Kula, Maria-Regina; Kroner, Karl-Heinz; Stach, Wolfgang; Hustedt, Helmut; Durekovic, Andija; and Grandja, Stefica, 4,144,130, Cl. 195-66.00R.
Stafford, Darrell E.: *See—*
Goloff, Alexander; Keske, Frank E.; Stafford, Darrell E.; and Stratton, Michael K., 4,143,629, Cl. 123-90.160.
Stafford, Frank. Mine roof support system. 4,143,991, Cl. 405-291.000.
Staflex International Limited: *See—*
Chapman, Frank; and Holt, David, 4,144,538, Cl. 346-153.000.
Stahl, Fritz, to Kollmorgen Technologies Corporation. Method of providing printed circuits. 4,144,118, Cl. 156-659.000.
Stamicarbon, B.V.: *See—*
Absil, Joseph H.; and Mengelers, Heinrich J., 4,144,164, Cl. 209-12.000.
Standard Oil Company (Indiana): *See—*
McCaulay, David A., 4,144,282, Cl. 260-683.680.
Starner, Eugene R.; and Nossen, Edward J., to RCA Corporation. Accurate phase-measuring system using arithmetic synthesis. 4,144,572, Cl. 364-487.000.
Starner, Eugene R.: *See—*
Nossen, Edward J.; and Starner, Eugene R., 4,144,579, Cl. 364-607.000.
Starr, Eugene W., to PPG Industries, Inc. Kiln and method for heating and bending glass sheets. 4,144,045, Cl. 65-107.000.
Stary, Rudolf; and Howald, Adolf, to Swiss Aluminium Ltd. Process for the removal of impurities from aluminum melts. 4,144,054, Cl. 75-68.00R.
Staszak, Albert P.: *See—*
Klug, Herbert H.; and Staszak, Albert P., 4,144,402, Cl. 174-52.0PE.
Stauffer Chemical Company: *See—*
Gaughan, Edmund J., 4,144,250, Cl. 260-340.50R.
Stearn, Richard A.: *See—*
Lenius, Norbert W.; and Stearn, Richard A., 4,143,781, Cl. 414-460.000.
Stefano, Gene E.: *See—*
Murphy, Michael J.; McVey, Dale E.; Slipcheck, David A.; and Stefano, Gene E., 4,143,892, Cl. 285-149.000.
Stegmann, Gerhard: *See—*
Knoke, Jurgen; Stegmann, Gerhard; Tecl, Bohuslav; and Fahrbach, Erich, 4,143,424, Cl. 2-255.000.
Stein Industrie S.A.: *See—*
Marjollet, Jacques; Palacio, Gerard; and Tondeur, Gerard, 4,143,619, Cl. 122-483.000.
Sterling Drug, Inc.: *See—*
Barr, James W., Jr., 4,143,702, Cl. 165-1.000.
Stern, Richard M., to Riker Laboratories, Inc. 3-(N-Imidazolyl)-2-nitrobenzofurans. 4,144,347, Cl. 424-273.00R.
Sternlieb, Jack J. Surgical lubricants. 4,143,423, Cl. 2-168.000.
Stevens, Harold E., to Music Specialities Corp. Electronic sensing and measuring apparatus for signals in audio frequency range. 4,144,490, Cl. 324-78.00D.
Stevens, Henry C., to PPG Industries, Inc. Triallyl carbonate monomers. 4,144,262, Cl. 260-463.000.
Stewart Game Calls, Inc.: *See—*
Stewart, Johnny E., 4,143,485, Cl. 46-180.000.
Stewart, Johnny E., to Stewart Game Calls, Inc. Game calls. 4,143,485, Cl. 46-180.000.
Stewart, Thomas, to Rohm and Haas Company. Method for removal of polymerization inhibitor. 4,144,137, Cl. 203-65.000.
Stoffel, James C., to Xerox Corporation. Apparatus and method for encoding halftone and line copy data. 4,144,547, Cl. 358-260.000.
Stone & Webster Engineering Corporation: *See—*
Pano, Benjamin V.; and Gandbhir, Sharad S., 4,143,521, Cl. 62-101.000.
Stotz, Wolf-Gunter: *See—*
Braun, Heinz; Kiesel, Karl; and Stotz, Wolf-Gunter, 4,143,828, Cl. 242-65.000.
Strandwitz, Peter: *See—*
McMillin, John R.; and Strandwitz, Peter, 4,143,793, Cl. 222-1.000.
Strassheimer, Herbert; and Ubelacker, Florian, to GKN Windsor GmbH. Apparatus for plasticizing granular synthetic plastic materials. 4,143,974, Cl. 366-78.000.
Stratford, Michael G.; and Lee, Ronald H. D. F., deceased (by Lee, Angel J., executor), to Burroughs Wellcome Co. Fluid dispensing device. 4,143,794, Cl. 222-42.000.
Stratton, Michael K.: *See—*
Goloff, Alexander; Keske, Frank E.; Stafford, Darrell E.; and Stratton, Michael K., 4,143,629, Cl. 123-90.160.
Streicher, Max, to Fordertechnik Streicher GmbH; and Streicher, Max. Eccentric worm pump with annular wearing elements. 4,144,001, Cl. 418-48.000.
Streit, Werner: *See—*
Scharf, Emil; Fikentscher, Rolf; Auhorn, Werner; and Streit, Werner, 4,144,123, Cl. 162-164.00R.
Stroman, Fritz: *See—*
Offermanns, Heribert; Klingler, Karl H.; Thiemer, Klaus; and Stroman, Fritz, 4,144,340, Cl. 424-253.000.
Strope, Daniel J., to Phillips Petroleum Company. Diolefin dimerization using nitrosyl halides of iron triad metals. 4,144,278, Cl. 260-666.00B.
Strunc, Gerald R.: *See—*
Laciak, Francis M.; and Strunc, Gerald R., 4,143,566, Cl. 83-42.000.
Stumpp, Gerhard, to Robert Bosch GmbH. Apparatus for regulating the composition of the operating mixture of an internal combustion engine. 4,143,631, Cl. 123-119.00A.
Stuwe, Arnd: *See—*
Grosche, Michael; Hofer, Roland; and Stuwe, Arnd, 4,144,311, Cl. 423-155.000.
Sugimura, Kazuo: *See—*
Sugimura, Nobuyuki; and Sugimura, Kazuo, 4,143,678, Cl. 138-30.000.
Sugimura, Nobuyuki; and Sugimura, Kazuo. Bladder type accumulator housing a gas bombe in its gas chamber. 4,143,678, Cl. 138-30.000.
Sugiura, Naokatsu, to Sansui Electric Co., Ltd. Stabilized DC power supply devices for providing a plurality of DC power outputs which are selectively consumed. 4,144,463, Cl. 307-75.000.
Sukhorukov, Alexandr E.: *See—*
Kandakov, Gennady P.; Miller, Viktor Y.; Sorokin, Lev A.; and Sukhorukov, Alexandr E., 4,143,704, Cl. 165-9.200.
Sullivan, Richard N., to Garrett Corporation, The. Hydraulic control system and method. 4,143,996, Cl. 417-15.000.
Sulzer Brothers Ltd.: *See—*
Bosshard, Ernst, 4,144,456, Cl. 250-437.000.
Luber, Paul, 4,143,679, Cl. 139-383.00R.
Sumida, Seizo: *See—*
Yoshida, Ryo; Sumida, Seizo; Itooka, Eiyoshi; Noguchi, Hiroshi; and Kamoshita, Katsuzo, 4,144,049, Cl. 71-120.000.
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Ito, Yasuro; Kaga, Hideharu; Yamamoto, Yasuhiro; Sumita, Tadayuki; Suzuki, Kuniomi; Kuroha, Kenji; Ishii, Takakazu; and Hayakawa, Mitsutaka, 4,143,541, Cl. 73-55.000.
Sumitomo Chemical Company, Limited: *See—*
Masuko, Fujio; Fujiyoshi, Kazuhiko; Ume, Yoshitaka; Nakai, Shinji; Kitamura, Shigeyoshi; and Umemura, Takeaki, 4,144,264, Cl. 260-465.00G.
Mori, Atsuo; Okita, Taisuke; Kitamura, Shuji; Kotani, Kozo; and Hama, Masaaki, 4,144,113, Cl. 156-334.000.
Yoshida, Ryo; Sumida, Seizo; Itooka, Eiyoshi; Noguchi, Hiroshi; and Kamoshita, Katsuzo, 4,144,049, Cl. 71-120.000.
Sumitomo Electric Industries, Inc.: *See—*
Hara, Ryoichi; Yajima, Masamichi; Akai, Chiaki; and Matsumoto, Takuzo, 4,143,833, Cl. 242-158.00R.
Sumitomo Electric Industries, Ltd.: *See—*
Hara, Ryoichi; Yajima, Masamichi; Akai, Chiaki; and Matsumoto, Takuzo, 4,143,834, Cl. 242-158.00R.
Sumitomo Metal Industries Limited: *See—*
Ito, Yoshinori; Kawai, Masaaki; and Ikeda, Masahiko, 4,144,443, Cl. 219-137.700.
Sumitomo Rubber Industries, Ltd.: *See—*
Iuchi, Munenori, 4,144,006, Cl. 425-33.000.
Sumiyoshi, Masaharu: *See—*
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,143,627, Cl. 123-75.00B.
Sumrell, Gene: *See—*
Mod, Robert R.; Harris, James A.; Arthur, Jett C., Jr.; Magne, Frank C.; Sumrell, Gene; and Novak, Arthur F., 4,144,256, Cl. 260-402.500.
Sun Coast Plastic Closures, Inc.: *See—*
Ferrell, Joseph C., 4,143,785, Cl. 215-270.000.
Sun Electric Corporation: *See—*
Trussell, Gerald C.; Caruth, James R.; Jalowiec, Phillip; and Pociask, Michael J., 4,144,573, Cl. 364-506.000.
Sundberg, Erik, to Aktiebolaget Tudor. Method of fabricating battery electrode sheaths. 4,144,115, Cl. 156-161.000.
Sundt, Erling; and Aschiero, Roland, to Firmenich SA. 3-Phenyl-cyclopent-2-en-1-one in perfume compositions. 4,144,200, Cl. 252-522.000.
Suovaniemi, Osmo. Method for improving the rate and measurement accuracy of chemical analysis. 4,144,030, Cl. 23-230.00R.
Super Sack Manufacturing Corporation: *See—*
Williamson, Robert R.; and Derby, Norwin C., 4,143,796, Cl. 222-185.000.
Surgical Appliance Industries, Inc.: *See—*
Williams, Marguerite R., 4,143,663, Cl. 128-527.000.

Sutton, John T., to Keyes Fibre Company. Container latching arrangement. 4,143,805, Cl. 229-44.00R.
Suzaki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takahashi, Kiyoshi; and Takimoto, Hiroyuki, to Canon Kabushiki Kaisha. Cine-projector. 4,143,951, Cl. 352-169.000.
Suzuki, Kuniomi: *See*—
Ito, Yasuro; Kaga, Hideharu; Yamamoto, Yasuhiro; Sumita, Tadayuki; Suzuki, Kuniomi; Kuroha, Kenji; Ishii, Takakazu; and Hayakawa, Mitsutaka, 4,143,541, Cl. 73-55.000.
Suzuki, Norihiko: *See*—
Fujimoto, Hirohisa; Suzuki, Norihiko; Shibazaki, Kenji; and Arai, Kenichi, 4,143,570, Cl. 83-205.000.
Suzuki, Yukio: *See*—
Ueno, Hiroshi; Tsurumaru, Michiko; Otsuka, Shinya; Matsubayashi, Hiroshi; Aizawa, Masanori; Sano, Hiroki; and Suzuki, Yukio, 4,143,790, Cl. 220-458.000.
Swank, Thomas F., to Polaroid Corporation. Process for making dispersions comprising spherical particles. 4,144,025, Cl. 8-79.000.
Swaringen, Roy A., Jr.: *See*—
Yeowell, David A.; and Swaringen, Roy A., Jr., 4,144,263, Cl. 260-465.00D.
Sweany, Glenn A., to Continental Oil Company. In-situ retorting of oil shale with in-situ formed arches. 4,143,917, Cl. 299-2.000.
Sweeney, William T.; and Plate, Thomas H., to Continental Oil Company. Slurry input for a multiple feed sump. 4,143,921, Cl. 302-14.000.
Sweeney, William T., to Continental Oil Company. Method of multiple point injection for slurry pipelines. 4,143,922, Cl. 302-14.000.
SWF-Spezialfabrik fur Autozubehor Gustave Rau GmbH: *See*—
Mutschler, Erich; and Weber, Adam, 4,144,425, Cl. 200-61.540.
Swift & Company: *See*—
Everman, Wayne F.; and Bernard, Vincent E., 4,143,773, Cl. 414-787.000.
Swiss Aluminium Ltd.: *See*—
Stary, Rudolf; and Howald, Adolf, 4,144,054, Cl. 75-68.00R.
Symeon, Gerald E., to General Electric Company. Static dissipating heat curable silicone rubber compositions. 4,144,206, Cl. 260-9.000.
Syntex Corporation: *See*—
Matthews, Gary J.; and Arnold, Robert A., 4,144,397, Cl. 562-466.000.
Szegedi, Nicholas J.: *See*—
Olson, Rodney I.; and Szegedi, Nicholas J., 4,143,670, Cl. 137-72.000.
Szekely, Laszlo: *See*—
Ivony, Jozsef; Lendvai, Imre; Szucs, Laszlo; and Szekely, Laszlo, 4,143,676, Cl. 137-625.230.
Szoky, Anton: *See*—
Schalch, Fred E.; and Szoky, Anton, 4,144,440, Cl. 219-61.500.
Szucs, Laszlo: *See*—
Ivony, Jozsef; Lendvai, Imre; Szucs, Laszlo; and Szekely, Laszlo, 4,143,676, Cl. 137-625.230.
Tachibana, Kyozo: *See*—
Okumura, Yoshio; Tachibana, Kyozo; Sato, Hiroshi; and Matsumoto, Genichi, 4,144,559, Cl. 363-88.000.
Tadakuma, Yuji; Saito, Syunji; and Eguchi, Toru, to Tokyo Electric Co., Ltd. Electronic cash register. 4,144,567, Cl. 364-405.000.
Taisei Corporation: *See*—
Ito, Yasuro; Kaga, Hideharu; Yamamoto, Yasuhiro; Sumita, Tadayuki; Suzuki, Kuniomi; Kuroha, Kenji; Ishii, Takakazu; and Hayakawa, Mitsutaka, 4,143,541, Cl. 73-55.000.
Takagi, Shunichi: *See*—
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Takahashi, Kiyoshi: *See*—
Suzaki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takahashi, Kiyoshi; and Takimoto, Hiroyuki, 4,143,951, Cl. 352-169.000.
Takahashi, Toshiro; Ikegaya, Masashi; and Ozaki, Masamichi, to Riken Keikinzoku Kogyo Kabushiki Kaisha. Method for producing colored anodic film on aluminum-based material. 4,144,142, Cl. 204-58.000.
Takahashi, Yasuo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Large aperture wide-angle photographic lens. 4,143,944, Cl. 350-214.000.
Takahashi, Yasuro; Yamamoto, Hisao; Sakai, Masayasu; and Takegawa, Toshiyuki, to Mitsubishi Jukogyo Kabushiki Kaisha. Burner. 4,144,016, Cl. 431-8.000.
Takahata, Kei; Murasawa, Sadao; and Maruo, Masatsuyo, to Ishihara Sangyo Kaisha, Ltd. Liquid developer. 4,144,184, Cl. 252-62.10L.
Takasago Perfumery Co., Ltd.: *See*—
Kumobayashi, Hidenori; Akutagawa, Susumu; and Komatsu, Akira, 4,144,257, Cl. 260-410.90R.
Takayama, Yoshikazu: *See*—
Utano, Takanori; Sakamoto, Masayuki; and Takayama, Yoshikazu, 4,144,409, Cl. 179-2.0EB.
Takeda, Hidetaka. Earplug. 4,143,657, Cl. 128-152.000.
Takeda, Kazutoshi; and Kishi, Iwao, to Kabushiki Kaisha Daini Seikosha. Alkaline cell. 4,144,382, Cl. 429-91.000.
Takeda, Noriyuki; and Kawamoto, Tamio, to Nissan Motor Company, Limited. Switch for vehicle transmission with automatic clutch. 4,144,424, Cl. 200-61.880.
Takegawa, Toshiyuki: *See*—
Takahashi, Yasuro; Yamamoto, Hisao; Sakai, Masayasu; and Takegawa, Toshiyuki, 4,144,016, Cl. 431-8.000.
Takeuchi, Hiromitsu, to Sharp Kabushiki Kaisha. Manufacture of an I^2L device utilizing staged selective diffusion thru a polycrystalline mask. 4,144,106, Cl. 148-175.000.
Takeuchi, Tomio: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Naganawa, Hiroshi; Ishizuka, Masaaki, all of; Shibamoto, Norio; Oki, Toshikazu; and Inui, Taiji, 4,144,329, Cl. 424-181.000.
Takeuchi, Yoshio: *See*—
Kimura, Yoshiaki; Takeuchi, Yoshio; Yamada, Mikio; Morishita, Taneji; and Yajima, Tatsuo, 4,144,537, Cl. 346-140.00R.
Takigawa, Toshio: *See*—
Noda, Yuzuru; Yoshihara, Mitsuo; and Takigawa, Toshio, 4,144,210, Cl. 260-29.20N.
Takimoto, Hiroyuki: *See*—
Suzaki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takahashi, Kiyoshi; and Takimoto, Hiroyuki, 4,143,951, Cl. 352-169.000.
Takiron Co., Ltd.: *See*—
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Taluba, Anthony P. Appendage such as a doll's head, a method for blow molding same of elastomer material, and a method for securing same to a body. 4,143,453, Cl. 29-453.000.
Tanabe, Shoji: *See*—
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Tanaka, Akio, to Zenith Radio Corporation. Television tuning method and apparatus for tuning employing slope factor derivation. 4,144,498, Cl. 325-464.000.
Tanaka, Noboru, to Tokyo Pipe Co. Ltd.; and Dankyo Seisakusho Co., Ltd. Cigarette lighter using hypergolic fuel component. 4,144,018, Cl. 431-131.000.
Tanaka, Taro: *See*—
Noguchi, Masaaki; Bunda, Tsuchio; and Tanaka, Taro, 4,143,620, Cl. 123-3.000.
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,143,627, Cl. 123-75.00B.
Tanaka, Yukiyasu: *See*—
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Tarasov, Vladimir P.: *See*—
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Taylor, Robert E., to Chamberlain Manufacturing Corporation. Container system for garage door opener. 4,143,803, Cl. 229-27.000.
Tazuma, James J.: *See*—
Bergomi, Angelo; and Tazuma, James J., 4,144,272, Cl. 260-567.000.
Tecl, Bohuslav: *See*—
Knoke, Jurgen; Stegmann, Gerhard; Tecl, Bohuslav; and Fahrbach, Erich, 4,143,424, Cl. 2-255.000.
Teichmann, Theodor: *See*—
Gomberg, Henry J.; Lewis, John G.; Teichmann, Theodor; and Teitel, Robert J., 4,144,150, Cl. 204-157.10H.
Teitel, Robert J.: *See*—
Gomberg, Henry J.; Lewis, John G.; Teichmann, Theodor; and Teitel, Robert J., 4,144,150, Cl. 204-157.10H.
Temple, Stephen; and Paton, Anthony D., to Cambridge Consultants Limited. Weaving looms. 4,143,685, Cl. 139-456.000.
Temple, Victor A. K.: *See*—
Schaefer, Donald L.; and Temple, Victor A. K., 4,144,541, Cl. 357-30.000.
Templin, Harry W., to FMC Corporation. Anti-collapsing chain having loop center link. 4,143,512, Cl. 59-85.000.
Tetsudo Kizai Kogyo Company Limited: *See*—
Matsubara, Kentaro; and Matsuo, Yoshio, 4,143,818, Cl. 238-349.000.
Tevald, Frank W.: *See*—
Kesten, Martin; and Tevald, Frank W., 4,143,597, Cl. 101-378.000.
Tews, Ricky R. Cement fence post. 4,143,859, Cl. 256-49.000.
Texaco Development Corporation: *See*—
Moss, Philip H.; and Yeakey, Ernest L., 4,144,035, Cl. 44-71.000.
Texaco Exploration Canada Ltd.: *See*—
Agnew, George H., 4,143,714, Cl. 166-252.000.
Texaco Inc.: *See*—
Cummings, William M., 4,144,034, Cl. 44-71.000.
Cummings, William M., 4,144,036, Cl. 44-71.000.
Kalfoglou, George; and Flournoy, Kenoth H., 4,143,716, Cl. 166-274.000.
Rao, Babu Y.; Herbstman, Sheldon; and Riordan, Michael D., 4,144,138, Cl. 203-46.000.
Texas Gas Transmission Corporation: *See*—
Gomberg, Henry J.; Lewis, John G.; Teichmann, Theodor; and Teitel, Robert J., 4,144,150, Cl. 204-157.10H.
Texas Instruments Incorporated: *See*—
Boyd, Alfred K., 4,143,979, Cl. 400-124.000.
Kitagawa, Norihisa; and White, Lionel S., Jr., 4,144,590, Cl. 365-205.000.
Shreve, William R., 4,144,507, Cl. 333-191.000.
Ward, Phillip W.; and Bybee, Halbert H., Jr., 4,144,489, Cl. 324-78.00D.
Teys, Raymond W.: *See*—
Zuvela, Bernard R.; and Teys, Raymond W., 4,143,721, Cl. 175-45.000.
Th. Kieserling & Albrecht: *See*—
Hartkopf, Heinz; and Schneider, Horst, 4,143,534, Cl. 72-98.000.

Thiel, Charles G.: *See—*
Rambosek, G. Phillip; and Thiel, Charles G., 4,143,658, Cl. 128-184.000.
Thiemer, Klaus: *See—*
Offermanns, Heribert; Klingler, Karl H.; Thiemer, Klaus; and Stroman, Fritz, 4,144,340, Cl. 424-253.000.
Thijssen, Henricus A. C., to Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel B.V. Process and apparatus for separating crystallizable materials from a multi-component system. 4,143,524, Cl. 62-542.000.
Thomas, Richard E.: *See—*
Haas, George A.; Shih, Arnold; and Thomas, Richard E., 4,144,488, Cl. 324-62.000.
Thompson, Harold R.: *See—*
Duval, Ernest H.; and Thompson, Harold R., 4,143,668, Cl. 132-88.500.
Thomson-CSF: *See—*
Desormiere, Bernard; Hepner, Georges; and Castera, Jean-Paul, 4,143,939, Cl. 350-96.130.
Mourier, Georges, 4,144,468, Cl. 310-72.000.
Timsit, Claude, 4,144,566, Cl. 364-200.000.
Thone, Bernd: *See—*
Rahn, Martin; Reh, Lothar; Thone, Bernd; and Vydra, Karel, 4,144,051, Cl. 75-9.000.
Thornley, Derek, to Lucas Industries Limited. Electrical polarity switch for battery. 4,144,483, Cl. 320-25.000.
Thornock, Tony G.: *See—*
Pisciotta, Emilio C.; and Thornock, Tony G., 4,144,448, Cl. 235-301.000.
Thornton, Donald I., to Fram Corporation. Fluid filter. 4,144,168, Cl. 210-130.000.
Thunholm, Carl H. G., to AB Bofors. Control device for missile or the like. 4,143,837, Cl. 244-3.220.
Thweatt, Carlisle, Jr., to Emerson Electric Co. Open coil electric heaters. 4,144,445, Cl. 219-532.000.
Tice, William G., to Byrd, Charles F.; and Dailey, William. Christmas tree apparatus. 4,144,364, Cl. 428-9.000.
Ticknor, William C., to Johnson Rubber Company, The. Heavy duty fender. 4,143,612, Cl. 114-219.000.
Tilley, Ronald F.: *See—*
Cunningham, Douglas J.; and Tilley, Ronald F., 4,143,831, Cl. 242-107.40A.
Tilson, Bernard A.: *See—*
Holtz, Roger E.; Tilson, Bernard A.; and Woods, Gordon D., 4,144,408, Cl. 179-16.00E.
Timsit, Claude, to Thomson-CSF. Parallel-type processor with a stack of auxiliary fast memories. 4,144,566, Cl. 364-200.000.
Todt, Enno, deceased: *See—*
Dotzer, Richard; Hauschildt, Hans-George; and Todt, Enno, deceased, 4,144,140, Cl. 204-14.00N.
Todt, Susanne, Ruth K. Todt, Ernst J. Todt, heirs: *See—*
Dotzer, Richard; Hauschildt, Hans-George; and Todt, Enno, deceased, 4,144,140, Cl. 204-14.00N.
Togawa, Kazuya; and Masaie, Kimio, to Murata Manufacturing Co., Ltd. Quadrature FM detector including low reactance phase shifter. 4,144,501, Cl. 329-118.000.
Toida, Takashi: *See—*
Nakajima, Fumio; Nikaido, Akira; Onda, Mitsuo; Machida, Takayasu; and Toida, Takashi, 4,144,467, Cl. 310-49.00R.
Tokunaga, Tadatsugu, to Nippon Electric Co., Ltd. Noise elimination for FM demodulators. 4,144,500, Cl. 325-480.000.
Tokyo Electric Co., Ltd.: *See—*
Tadakuma, Yuji; Saito, Syunji; and Eguchi, Toru, 4,144,567, Cl. 364-405.000.
Tokyo Pipe Co. Ltd.: *See—*
Tanaka, Noboru, 4,144,018, Cl. 431-131.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Fukuda, Tsuguo; and Hirano, Hitoshi, 4,144,117, Cl. 156-617.0SP.
Kageyama, Satoshi; and Sekiya, Kunihiko, 4,144,522, Cl. 340-146.1BA.
Miyakawa, Tadashi; Nakane, Masayoshi; Watanabe, Masafumi; and Osaka, Yoshio, 4,144,587, Cl. 365-94.000.
Tomar, Julius, to Home of Champions, S. A. Method of injection molding a foamed thermoplastic resin ball core having an integral skin. 4,144,297, Cl. 264-45.500.
Tomoshige, Kazuhiro: *See—*
Wakebe, Yoshitaka; Matsumoto, Hirofumi; Momohara, Hiedo; Tsuchida, Yasuyuki; and Tomoshige, Kazuhiro, 4,143,557, Cl. 74-217.00B.
Tondeur, Gerard: *See—*
Marjollet, Jacques; Palacio, Gerard; and Tondeur, Gerard, 4,143,619, Cl. 122-483.000.
Topfl, Rosemarie: *See—*
Keller, Rudolf; and Topfl, Rosemarie, 4,144,026, Cl. 8-115.600.
Topliss, John G.: *See—*
Neri, Rudolph O.; and Topliss, John G., 4,144,270, Cl. 260-562.00R.
Toray Industries, Inc.: *See—*
Ueno, Hiroshi; Tsurumaru, Michiko; Otsuka, Shinya; Matsubayashi, Hiroshi; Aizawa, Masanori; Sano, Hiroki; and Suzuki, Yukio, 4,143,790, Cl. 220-458.000.
Toray Silicone Company, Ltd.: *See—*
Shinmi, Hideo; and Hanada, Tsuneo, 4,144,222, Cl. 260-37.0SB.
Torii, Yasuhiro: *See—*
Yonezawa, Susumu; Torii, Yasuhiro; Ogiwara, Haruo; and Nakamura, Gisaku, 4,143,937, Cl. 350-3.820.
Toschakov, Robert A.: *See—*
Malyshev, Boris N.; Saljuk, Viktor A.; Skobelkin, Oleg K.; Toschakov, Robert A.; Brekhov, Evgeny I.; Egorov, Evgeny I.; and Ivanov, Alexei I., 4,143,660, Cl. 128-303.100.
Toth, Gyorgy: *See—*
Bognar, Reszo; Makleit, Sandor; Kiss, Geza; Berenyi, Sandor; Mile, Terez; Knoll, Jozsef; Elek, Sandor; Gyoker, Istvan; Zoltai, Attila; Toth, Gyorgy; and Litkei, Laszlo, 4,144,236, Cl. 546-46.000.
Towlsaver, Inc.: *See—*
Tucker, Council A., 4,143,827, Cl. 242-55.300.
Townsend, Barclay A.: *See—*
Scudder, Monty; and Townsend, Barclay A., 4,144,365, Cl. 428-10.000.
Toyo Ink Manufacturing Co., Ltd.: *See—*
Matsubara, Toru, 4,144,283, Cl. 260-836.000.
Toyo Seikan Kaisha Ltd.: *See—*
Ueno, Hiroshi; Tsurumaru, Michiko; Otsuka, Shinya; Matsubayashi, Hiroshi; Aizawa, Masanori; Sano, Hiroki; and Suzuki, Yukio, 4,143,790, Cl. 220-458.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Konishi, Masami; Futamura, Kazumasa; Noda, Takashi; and Morikawa, Nobutaka, 4,143,513, Cl. 60-282.000.
Oka, Hiroyuki, 4,143,744, Cl. 188-1.00A.
Shindo, Yoshio; and Ito, Hiroshi, 4,143,563, Cl. 74-867.000.
Traben, Josef, to Gerbruder Linck Maschinenfabrik und Eisengiesserei, Firma. Method for the production of timber from round logs. 4,143,692, Cl. 144-323.000.
Tracy, Michael J., to Xerox Corporation. Retractable support member. 4,143,960, Cl. 355-3.00R.
Tran, Nguon T. Window wipe. 4,144,091, Cl. 134-6.000.
Trane Company, The: *See—*
Lewis, Carl M.; and Ferguson, Peter D., 4,143,707, Cl. 165-28.000.
Trankle, Erich. Auxiliary device for laying flexible wall and floor coverings. 4,143,463, Cl. 33-174.00G.
Transkirt Corporation: *See—*
Neubauer, Frank, 4,143,891, Cl. 282-27.500.
Trepanier, Donald L.: *See—*
Britton, Thomas C.; and Trepanier, Donald L., 4,144,233, Cl. 260-239.30B.
Trevarrow, David: *See—*
Main, John A.; and Trevarrow, David, 4,143,449, Cl. 29-159.100.
Troponwerke Dinklage & Co.: *See—*
Boltze, Karl-Heinz; Seidel, Peter-Rudolf; Jacobi, Haireddin; and Schwarz, Helmut, 4,144,336, Cl. 424-248.540.
Trotman, Helen H.: *See—*
Trotman, Herbert H.; and Trotman, Helen H., 4,143,916, Cl. 297-453.000.
Trotman, Herbert H.; and Trotman, Helen H. Under-body ventilating seat cushion. 4,143,916, Cl. 297-453.000.
True Temper Corporation: *See—*
Zemans, Jeffrey T., 4,144,089, Cl. 134-2.000.
Trullas, Isidro F., to Argelich, Termes Y Cia., S.A. Apparatus for the wet treatment of fabrics. 4,143,527, Cl. 68-18.00F.
Trussell, Gerald C.; Caruth, James R.; Jalowiec, Phillip; and Pociask, Michael J., to Sun Electric Corporation. Metering system. 4,144,573, Cl. 364-506.000.
Tsuchida, Yasuyuki: *See—*
Wakebe, Yoshitaka; Matsumoto, Hirofumi; Momohara, Hiedo; Tsuchida, Yasuyuki; and Tomoshige, Kazuhiro, 4,143,557, Cl. 74-217.00B.
Tsuchihashi, Genichi; and Ogura, Katsuyuki, to Sagami Chemical Research Center. Aromatic acetic acid derivatives having sulfur atom at alpha-position and process for their preparation. 4,144,248, Cl. 260-332.20A.
Tsuchiya, Yukio: *See—*
Nakazono, Jiro; Kodama, Akihiko; and Tsuchiya, Yukio, 4,143,738, Cl. 181-159.000.
Tsuda, Hiroshi: *See—*
Matsuyama, Takashi; Tsuda, Hiroshi; and Kasuga, Muneo, 4,143,963, Cl. 355-14.000.
Tsuji, Nobuo: *See—*
Yoneyama, Masakazu; Inoue, Noriyuki; Tsuji, Nobuo; and Kameoka, Kimitaka, 4,144,069, Cl. 96-63.000.
Tsukiyama, Satoru: *See—*
Kodama, Tadashi; Murakami, Masayuki; Kimeda, Tsuneji; Matsuoka, Tadahiko; Hara, Osamu; and Tsukiyama, Satoru, 4,144,413, Cl. 179-90.00R.
Tsurumaru, Michiko: *See—*
Ueno, Hiroshi; Tsurumaru, Michiko; Otsuka, Shinya; Matsubayashi, Hiroshi; Aizawa, Masanori; Sano, Hiroki; and Suzuki, Yukio, 4,143,790, Cl. 220-458.000.
Tu, George K.; Baker, Lamar T.; Markle, Robert E.; and Mager, George E., to Xerox Corporation. Chip topography for MOS integrated circuitry microprocessor chip. 4,144,561, Cl. 364-200.000.
Tu, George K.: *See—*
Baker, Lamar T.; and Tu, George K., 4,144,589, Cl. 365-203.000.
Tubata, Noritaka: *See—*
Murai, Ryukichi; and Tubata, Noritaka, 4,143,680, Cl. 139-384.00B.
Tucker, Council A., to Towlsaver, Inc. Roll holder for mounting split-core rolls of tissue in a dispenser. 4,143,827, Cl. 242-55.300.
Tucker, Robert J.: *See—*
Hoffman, Joseph A.; and Tucker, Robert J., 4,144,029, Cl. 8-180.000.

Tucker, Thomas: *See*—
Kaye, Robert M.; Eiloo, Gary A.; and Tucker, Thomas, 4,144,486, Cl. 324-3.000.
Tuft, Roy E.: *See*—
DeVries, Robert C.; and Tuft, Roy E., 4,143,544, Cl. 73-104.000.
Turbett, Robert J.: *See*—
Ashcraft, Arnold C.; Turbett, Robert J.; and Burke, Timothy R., 4,144,202, Cl. 252-63.200.
Turunen, Risto; Soikkanen, Pertti; and Koponen, Martti, to Valmet Oy. Machine for manufacturing paper such as tissue paper. 4,144,124, Cl. 162-290.000.
Tuttle, Orvil, to Brunswick Corporation, John G. Heimovics Brunswick Corp. One Brunswick Plaza Skokie, Ill. 60076. Materable unitary edge member and panel. 4,143,501, Cl. 52-731.000.
U, Aung S., to International Telephone & Telegraph Corp. Substrate-fed injection-coupled memory. 4,144,586, Cl. 365-156.000.
Ubel, Helmut, to International Standard Electric Corporation. Brake control device taking into account different brake activating times. 4,143,842, Cl. 246-182.00B.
Ubelacker, Florian: *See*—
Strassheimer, Herbert; and Ubelacker, Florian, 4,143,974, Cl. 366-78.000.
Uebbing, John J.; and Jeung, Perry, to Hewlett-Packard Company. Optical bar code reader. 4,143,809, Cl. 235-462.000.
Ueda, Shigeo: *See*—
Utsunomiya, Tadashi; Ueda, Shigeo; Kamachi, Kiyotaka; and Wakamiya, Masatoshi, 4,143,454, Cl. 29-460.000.
Ueno, Hiroshi; Tsurumaru, Michiko; Otsuka, Shinya; Matsubayashi, Hiroshi; Aizawa, Masanori; Sano, Hiroki; and Suzuki, Yukio, to Toray Industries, Inc.; and Toyo Seikan Kaisha Ltd. Coated metal structure and process for production thereof. 4,143,790, Cl. 220-458.000.
Ullmann, Karl H., to Harnischfeger Corporation. Shovel attachment means for hydraulic excavator. 4,143,778, Cl. 414-694.000.
Ultimate Engineering Corporation: *See*—
Hill, John A., Jr., 4,143,814, Cl. 237-1.00A.
Ume, Yoshitaka: *See*—
Masuko, Fujio; Fujiyoshi, Kazuhiko; Ume, Yoshitaka; Nakai, Shinji; Kitamura, Shigeyoshi; and Umemura, Takeaki, 4,144,264, Cl. 260-465.00G.
Umemura, Takeaki: *See*—
Masuko, Fujio; Fujiyoshi, Kazuhiko; Ume, Yoshitaka; Nakai, Shinji; Kitamura, Shigeyoshi; and Umemura, Takeaki, 4,144,264, Cl. 260-465.00G.
Umemura, Yoshiharu; and Matsuura, Shigeo, to Hitachi, Ltd. AFC voltage superimposing circuit for electronic tuner. 4,144,512, Cl. 334-15.000.
Umezawa, Hamao; Takeuchi, Tomio; Naganawa, Hiroshi; Ishizuka, Masaaki, all of; Shibamoto, Norio; Oki, Toshikazu; and Inui, Taiji, to Zaidan Hojin Biseibutsu Kagaku KenkyuKai. Antitumor antibiotics MA 144-M_1 and MA 144-M_2. 4,144,329, Cl. 424-181.000.
Unger, Eberhard, to Gewerkschaft Eisenhutte Westfalia. Drive shield. 4,143,519, Cl. 405-145.000.
Unholz, Rainer: *See*—
Ruckert, Hans; and Unholz, Rainer, 4,144,067, Cl. 96-36.000.
Union Carbide Corporation: *See*—
Ashcraft, Arnold C.; Turbett, Robert J.; and Burke, Timothy R., 4,144,202, Cl. 252-63.200.
Chan, John K., 4,144,261, Cl. 260-453.0RW.
Union Oil Company of California: *See*—
Erich, Otis G., Jr., 4,143,737, Cl. 181-121.000.
Gallus, Julius P., 4,144,077, Cl. 106-97.000.
Unique, Ervin L. Three dimensional ball game device. 4,143,878, Cl. 273-241.000.
Uniroyal: *See*—
Igea, Gilbert L.; Mirtain, Henri J.; and Uniroyal, 4,143,697, Cl. 152-340.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Adams, Lionel B.; Fydelor, Peter J.; Partridge, Gordon; and Pithouse, Kenneth B., 4,144,301, Cl. 264-126.000.
Fitzgerald-Smith, James P.; and Knight, Derek I., 4,143,439, Cl. 14-10.000.
United States of America
Agriculture: *See*—
Mod, Robert R.; Harris, James A.; Arthur, Jett C., Jr.; Magne, Frank C.; Sumrell, Gene; and Novak, Arthur F., 4,144,256, Cl. 260-402.500.
Air Force: *See*—
Ley, Gordon S., 4,144,577, Cl. 364-571.000.
Puchalska-Hibner, Irena, 4,144,585, Cl. 365-3.000.
Army: *See*—
Brody, Philip S., 4,144,591, Cl. 365-228.000.
Jennings, Walter B., Jr.; McKnight, William B.; and Milton, Richard D., 4,143,835, Cl. 244-311.000.
Layden, Owen P.; and Murdoch, Francis J., 4,143,543, Cl. 73-827.000.
Levy, Marilyn; and Ball, Vincent W., 4,143,971, Cl. 356-404.000.
Merritt, James A., 4,144,151, Cl. 204-157.10R.
Energy: *See*—
Groh, Edward F.; McDowell, William; Modjeski, Norbert S.; Keefe, Donald J.; and Groer, Peter, 4,144,454, Cl. 250-435.000.
Liu, Chain T.; and Inouye, Henry, 4,144,059, Cl. 75-170.000.
Loree, Thomas R.; and Barker, Dean L., 4,144,464, Cl. 307-88.300.
Health, Education and Welfare: *See*—
Kutney, James P., 4,144,237, Cl. 260-244.400.
Interior: *See*—
Block, Jacob, 4,144,185, Cl. 252-180.000.
Navy: *See*—
Anderson, Bern; and Seiler, Donald W., 4,143,978, Cl. 400-90.000.
Angelbeck, Albert W.; Mapes, Stuart N.; and Wisner, George R., 4,144,505, Cl. 331-94.50S.
Bottka, Nicholas, 4,144,540, Cl. 357-30.000.
Haas, George A.; Shih, Arnold; and Thomas, Richard E., 4,144,488, Cl. 324-62.000.
Holladay, Samuel P., 4,143,838, Cl. 244-3.280.
Koehler, Richard L., 4,143,549, Cl. 73-342.000.
Leo, Bruno S.; and Liu, Chang P., 4,143,946, Cl. 350-310.000.
Prickett, Michael J.; and Humpherys, Bernarr H., 4,144,534, Cl. 343-6.5LC.
Redfern, John T., 4,144,530, Cl. 340-566.000.
Skaalen, Clifford L., 4,143,440, Cl. 14-77.000.
Zimmerman, James E., 4,143,520, Cl. 62-6.000.
Veterans Affairs: *See*—
Hall, C. William; Mallow, William A.; and Hoese, Fred O., 4,143,426, Cl. 3-6.000.
U.S. Philips Corporation: *See*—
Almer, Friedrich H. R., 4,144,473, Cl. 313-315.000.
Delen, Robert R. M.; and Lenaerts, Duido J. J., 4,144,475, Cl. 315-73.000.
Hartl, Walter, 4,144,471, Cl. 313-60.000.
Hasker, Jan; van Ijzendoorn, Petrus R.; and Roelofs, Hendrik, 4,143,447, Cl. 29-25.130.
Jacob, Guy M.; and Hallais, Jean P., 4,144,116, Cl. 156-611.000.
Khoe, Giok D., 4,143,940, Cl. 350-96.150.
van Loon, Hermanus; and Willems, Henricus G. A., 4,144,472, Cl. 313-217.000.
Wagner, Wolfgang, 4,144,569, Cl. 364-414.000.
Wagner, Wolfgang, 4,144,570, Cl. 364-414.000.
University of Michigan, The Regents of the: *See*—
Voorhees, John J., 4,144,332, Cl. 424-240.000.
Unno, Naoyuki; Yoshino, Mutsuyuki; and Murata, Minoru, to Kyowa Hakko Kogyo Co., Ltd. Method for promoting secretion of milk of livestock. 4,144,354, Cl. 426-2.000.
UOP Inc.: *See*—
Winter, George R., III, 4,144,280, Cl. 260-671.00R.
Upjohn Company, The: *See*—
Bundy, Gordon L., 4,144,253, Cl. 260-343.410.
Bundy, Gordon L., 4,144,273, Cl. 260-590.00C.
Bundy, Gordon L., 4,144,274, Cl. 260-590.00C.
Bundy, Gordon L., 4,144,276, Cl. 568-645.000.
Ushiro, Soichiro: *See*—
Enokizono, Shigehiro; and Ushiro, Soichiro, 4,144,127, Cl. 195-63.000.
Utano, Takanori; Sakamoto, Masayuki; and Takayama, Yoshikazu, to Nippon Telegraph and Telephone Public Corporation; and Nippon Electric Co., Ltd. Mobile radio communication control system for preventing erroneous reception of control signals. 4,144,409, Cl. 179-2.0EB.
Utsunomiya, Tadashi; Ueda, Shigeo; Kamachi, Kiyotaka; and Wakamiya, Masatoshi, to Bridgestone Tire Company Limited. Method of fixing connection parts of rubber offshore structures. 4,143,454, Cl. 29-460.000.
Vagner, Daniel: *See*—
Jeanson, Rene H.; and Vagner, Daniel, 4,143,614, Cl. 115-41.0HT.
Vainshtein, Viktor A.; Kulbakh, Valter O.; Etingov, Evgeny D.; Naumchik, Grigory N.; Ekzemplyarov, Oleg N.; Mikhailets, Georgy A.; Grinberg, Grigory E.; and Egorenkova, Alla N. N,N,N-Trimethyl derivatives of polyene amphoteric antibiotics, process of producing same and pharmaceutical composition. 4,144,328, Cl. 424-180.000.
Valmet Oy: *See*—
Turunen, Risto; Soikkanen, Pertti; and Koponen, Martti, 4,144,124, Cl. 162-290.000.
Value Engineering Company: *See*—
Smith, David W.; and Logrando, John C., 4,144,551, Cl. 361-93.000.
Van Doorne's Transmissie B.V.: *See*—
van Deursen, Petrus H.; and Ludoph, Hemmo H. J., 4,143,558, Cl. 74-230.17F.
Vandergriff, Arvel L. Even heat parallel flow tower dryer. 4,143,470, Cl. 34-10.000.
van der Heem, Peter, to J. M. Huber Corporation. Nitrocellulose coating composition. 4,144,081, Cl. 106-193.00J.
Vanderlinde, William: *See*—
Morgan, Albert W.; Schumacher, Ignatius; and Vanderlinde, William, 4,144,394, Cl. 544-84.000.
van Deursen, Petrus H.; and Ludoph, Hemmo H. J., to Van Doorne's Transmissie B.V. Variable-V-belt transmission. 4,143,558, Cl. 74-230.17F.
Van Hijfte, Herman M.; and Bergman, Jan, to Hollandse Signaalapparaten B.V. Automatic gain control circuit for a pulsed radar. 4,144,533, Cl. 343-7.0AG.
van Huuksloot, Leendert, to Nemag, B.V. Mechanical grab. 4,143,901, Cl. 294-70.000.
van Ijzendoorn, Petrus R.: *See*—
Hasker, Jan; van Ijzendoorn, Petrus R.; and Roelofs, Hendrik, 4,143,447, Cl. 29-25.130.
van Loon, Hermanus; and Willems, Henricus G. A., to U.S. Philips Corporation. Glow discharge lamp. 4,144,472, Cl. 313-217.000.

Van Meter, William. Pipe clamp. 4,143,844, Cl. 248-62.000.
van Raay, Albertus, to Machinefabriek "Finis" B.V. Peeling machine. 4,143,593, Cl. 99-631.000.
Vapor Corporation: *See—*
Beaulieu, Adrian A., 4,143,642, Cl. 126-271.000.
Vasiliev, Viktor I.: *See—*
Nemtsov, Nikolai S.; Vasiliev, Viktor I.; Tarasov, Vladimir P.; Pliskanovsky, Stanislav T.; Shokul, Anatoly A.; Kravchenko, Anatoly P.; Kraizinger, Fedor V.; and Krjukov, Ivan I., 4,143,777, Cl. 414-170.000.
Veb Kombinat Fortschritt Landmaschinen Neustadt In Sachsen: *See—*
Noack, Christian; Oliva, Klaus; Eistert, Theodor; Zumpf, Bernd; Spaida, Hans P.; John, Gunter; Pietschmann, Frank; Boltizar, Pal; Fabry, Istvan; Vida, Csongor; Lakos, Lajos; and Klement, Matyas, 4,143,504, Cl. 56-98.000.
Veeder Industries Inc.: *See—*
Voegelin, Howard J., 4,144,428, Cl. 200-159.00A.
Venzke, Charles E.: *See—*
Foster, Lloyd L.; Gaarder, Gary D.; and Venzke, Charles E., 4,143,751, Cl. 198-365.000.
Verdin, Sam M. Method and apparatus for taking core samples. 4,143,720, Cl. 175-5.000.
Vereinigte Flugtechnische Werke-Fokker GmbH: *See—*
Graewe, Eberhard; and Krajeweski, Siegfried, 4,143,548, Cl. 73-181.000.
Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft: *See—*
Augustin, Hubert; Friesenbichler, Eduard; and Moser, Alfred, 4,144,442, Cl. 219-106.000.
Laimer, Friedrich; and Herrmann, Herbert, 4,143,864, Cl. 266-158.000.
Vergari, Louis P.: *See—*
Bouknecht, Max A.; and Vergari, Louis P., 4,144,565, Cl. 364-200.000.
Verhoeven, Arthur P.: *See—*
Ardezzone, Frank J.; and Verhoeven, Arthur P., 4,144,536, Cl. 346-33.00F.
Vermeulen, Leon L.; and Mertens, Ludovicus M., to AGFA-GEVAERT N.V. Photographic material for use in the silver complex diffusion transfer process. 4,144,064, Cl. 96-29.00L.
Vetter, Manfred. Jacking device. 4,143,854, Cl. 254-93.0HP.
Victoreen, Inc.: *See—*
Glasser, Herman; and Panetta, Patrick F. (said Herman Glasser assors. to), 4,144,461, Cl. 250-506.000.
Vida, Csongor: *See—*
Noack, Christian; Oliva, Klaus; Eistert, Theodor; Zumpf, Bernd; Spaida, Hans P.; John, Gunter; Pietschmann, Frank; Boltizar, Pal; Fabry, Istvan; Vida, Csongor; Lakos, Lajos; and Klement, Matyas, 4,143,504, Cl. 56-98.000.
Vinezeano, Anthony D.: *See—*
Brown, Fred; and Vinezeano, Anthony D., 4,144,510, Cl. 333-241.000.
Virginia Commonwealth University: *See—*
Hawkridge, Fredrick M.; and Landrum, Harlie L., 4,144,143, Cl. 204-72.000.
Visvydas, Pranas, to Container Corporation of America. Partition with integral tier separator. 4,143,804, Cl. 229-42.000.
Vitatect Corp.: *See—*
Plakas, Chris J., 4,144,134, Cl. 195-103.50M.
Voegelin, Howard J., to Veeder Industries Inc. Electrical switch with leaf spring switching element. 4,144,428, Cl. 200-159.00A.
Voelkl, Erfried: *See—*
Leutner, Bernd; Scizi, Gotthard; Lukas, Siegmar; Schreiner, Siegfried; and Voelkl, Erfried, 4,144,146, Cl. 204-92.000.
Voitko, Alexei F.: *See—*
Antonov, Oleg K.; Maslov, Valentin T.; and Voitko, Alexei F., 4,143,839, Cl. 244-76.00R.
Volkswagenwerk Aktiengesellschaft: *See—*
Heitland, Herbert; Kroll, Rudolf; and Grundmann, Edgard, 4,143,644, Cl. 126-271.000.
Siebels, Johann, 4,144,195, Cl. 252-455.00R.
Volodin, Nikolai L.: *See—*
Dementiev, Valentin V.; Zhidovich, Anatoly I.; Mosse, Alfred L.; Yasko, Oleg I.; Polak, Lev S.; Gulyaev, Genrikh V.; Levenzon, Rafail I.; Volodin, Nikolai L.; Vurzel, Filipp B.; and Laktjushin, Alexandr N., 4,144,444, Cl. 219-383.000.
Voloshin, Rafail Y.; Grachev, Leonid P.; Radutsky, Grigory A.; and Kheifets, Rafail E. Folder delivery arrangement for reel-fed rotary printing for presses. 4,143,870, Cl. 270-47.000.
Voorhees, John J., to University of Michigan, The Regents of the. Process for alleviating proliferative skin diseases. 4,144,332, Cl. 424-240.000.
Voykin, Andrew N. Anti-roost device. 4,143,437, Cl. 9-8.00R.
Voyt, Walter F. Method of and composition for preventing sunburn while affording tanning. 4,144,325, Cl. 424-59.000.
Vsesojuzny nauchno-issledovatelsky i experimentalno-konstruktorsky institut prodovolstvennogo mashinostroenia VNIEKIPRODMASH: *See—*
Yaroshenko, Jury F.; Gonsales, Rodriges S.; Rogozhin, Sergei V.; and Misjurev, Vladimir I., 4,143,591, Cl. 99-483.000.
Vuitel, Laurent: *See—*
L'Eplattenier, Francois; and Vuitel, Laurent, 4,144,258, Cl. 542-418.000.
Vurzel, Filipp B.: *See—*
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Wada, Naoto: *See—*
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Wada, Shinji; and Isobe, Yoshiyuki, to Kabushiki Kaisha Suwa Seikosha. Solar battery and method of manufacture. 4,144,096, Cl. 136-89.00P.
Wade, Don W., to Rheem Manufacturing Company. Retainer for releasable securement of drums and sealing caps. 4,143,789, Cl. 220-323.000.
Wagner, Hans: *See—*
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Wagner, Wolfgang, to U.S. Philips Corporation. Method and arrangement for compensating motion artifacts in computed tomography. 4,144,569, Cl. 364-414.000.
Wagner, Wolfgang, to U.S. Philips Corporation. Method of and device for measuring the distribution of a radiation in a plane of a body. 4,144,570, Cl. 364-414.000.
Wahlen, Svante L.: *See—*
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Wakamatsu, Shuichi. Character writing system. 4,144,405, Cl. 178-30.000.
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Wakebe, Yoshitaka; Matsumoto, Hirofumi; Momohara, Hiedo; Tsuchida, Yasuyuki; and Tomoshige, Kazuhiro, to Sanyo Electric Co., Ltd. Control system for use in a multiple speed transmission system. 4,143,557, Cl. 74-217.00B.
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Waligorski, Gordon J., to Desco Corporation. Ultrasonic welding of plastic members. 4,144,109, Cl. 156-73.100.
Walker, Darrell W.; and Farha, Floyd E., Jr., to Phillips Petroleum Company. Dehydrogenation of hydrocarbons with zinc titanate catalyst. 4,144,277, Cl. 260-666.00A.
Walker, Duane H., to National Presto Industries, Inc. Captivated overpressure relief air vent assembly. 4,143,787, Cl. 220-203.000.
Wall, Robert G., to Chevron Research Company. Alcohol production. 4,144,401, Cl. 568-840.000.
Wall, Wilfred F.: *See—*
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Wallenfang, Jerome A., to Koehring Company. Self-cleaning sprocket assembly. 4,143,757, Cl. 198-494.000.
Walter Kidde & Company, Inc.: *See—*
Floyd, Alfred E., 4,143,531, Cl. 70-367.000.
Wang, Patricia C.; and Wingard, Robert E., to Dynapol. Water-soluble amine-linked polymeric colorants. 4,144,252, Cl. 260-371.000.
Ward, Phillip W.; and Bybee, Halbert H., Jr., to Texas Instruments Incorporated. Simplified frequency to digital converter using all digital electronics. 4,144,489, Cl. 324-78.00D.
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Washington Gas Light Company: *See—*
Kaye, Robert M.; Eiloo, Gary A.; and Tucker, Thomas, 4,144,486, Cl. 324-3.000.
Wason, Satish K., to J. M. Huber Corporation. Amorphous precipitated siliceous pigments and methods for their production. 4,144,321, Cl. 424-49.000.
Wass, Brian J., to Redpath Dorman Long Limited. Composite deck panel. 4,144,369, Cl. 428-183.000.
Watanabe, Masafumi: *See—*
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Watanabe, Morio; and Nishimura, Sanji, to Solex Research Corporation. Process for recovery of reusable chromic acid from the waste

chromic acid solution containing impurities. 4,144,145, Cl. 204-89.000.

Watanabe, Takeshi; and Kodama, Kenichiro, to Dow Chemical Company, The. Vinylidene chloride resin compositions containing chlorinated ethylene/acrylate or methacrylate copolymer. 4,144,289, Cl. 260-897.00C.

Waterson, James F.: *See*—
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Webber, William F., to E-Systems, Inc. Vehicle guidance system. 4,144,571, Cl. 364-450.000.

Weber, Adam: *See*—
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Weber, Gunter; and Schaumburg, Gunter, to Neiman S.A. Anti-theft locking devices. 4,143,528, Cl. 70-1.500.

Weber, Robert L., to Webston Incorporated. Coffee brewing apparatus and method. 4,143,589, Cl. 99-282.000.

Webston Incorporated: *See*—
Weber, Robert L., 4,143,589, Cl. 99-282.000.

Wedemeyer, Karlfried: *See*—
Fiege, Helmut; Haydn, Josef; Renner, Johann; and Wedemeyer, Karlfried, 4,144,400, Cl. 568-788.000.

Weibel, Gerhard E., to Zenith Radio Corporation. Electronic timekeeping system with electro-mechanically-driven analog display and electrical integral hour reset feature. 4,143,509, Cl. 58-23.00D.

Weiner, Robert I. Safety/privacy fence. 4,143,857, Cl. 256-11.000.

Weiner, Sidney: *See*—
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Weir Pumps Limited: *See*—
Ryall, Michael L., 4,143,999, Cl. 417-424.000.

Weiss, Donald E.; Dixon, David R.; and West, Simon M., to Commonwealth Scientific and Industrial Research Organization; and Kraft Foods Ltd. Materials for the separation of organic substances from solution. 4,144,373, Cl. 428-306.000.

Weissenfels, Franz: *See*—
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Weissenmayer, Heinz: *See*—
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Welsh, Howard, to Bennett Pollution Controls, Ltd. Connector for sections of oil containment boom. 4,143,987, Cl. 403-348.000.

Wenschhof, Donald E., Jr.: *See*—
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Werner, Dietmar: *See*—
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Werner, Paul: *See*—
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Werthaiser, Martin S.; and Legoski, Paul L. Method of conditioning garneted polyester for blow injecting as insulation in goods, and apparatus therefor. 4,144,294, Cl. 264-15.000.

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West, Burke A.; and Bethell, Michael R., to Monroe Auto Equipment Company. Snow vehicle suspension system. 4,143,729, Cl. 180-5.00R.

West, Harold H., to APV Corporation. Anti-pollution valve for use with shipboard storage tanks. 4,143,672, Cl. 137-81.000.

West, Simon M.: *See*—
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Westinghouse Electric Corp.: *See*—
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Kowalik, Peter M.; and Milianowicz, Stanislaw A., 4,144,426, Cl. 200-148.00A.

Wetherall, Henry E.; and Mount Hill, Edith K., to Q. V. Sales Limited. Gathering implement. 4,143,899, Cl. 294-50.900.

White, Dennis L.: *See*—
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White, Jerrie L. Sighting device. 4,143,465, Cl. 33-233.000.

White, Lionel S., Jr.: *See*—
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Whittingham, M. Stanley: *See*—
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Wichman, Heins. Splinting of members. 4,143,653, Cl. 128-87.00A.

Wicker, Ralph C., to Haggquist, Benjamin J., a part interest. Latent photo system. 4,143,967, Cl. 355-77.000.

Widder Corporation: *See*—
Krieg, Adrian H., 4,143,862, Cl. 266-56.000.

Wiener, Robert. Reusable gasket for use in and in combination with a molding apparatus. 4,143,852, Cl. 249-135.000.

Wiener, Robert P., to Litton Systems, Inc. Sucker rod pump dynamometer. 4,143,546, Cl. 73-151.000.

Wieser, Louis, to J. Bobst & Fils, S.A. Device for removing a selected box from a succession of moving boxes. 4,143,771, Cl. 209-583.000.

Willard, Lars-Olof: *See*—
Hernestam, Sven E. H.; Nilsson, Nils A.; and Willard, Lars-Olof, 4,144,320, Cl. 424-48.000.

Wille, Hans J.; Konst, Wilhelmus M. B.; and Kos, Jan, to Naarden International, N.V. Safranic acid ester perfume compositions. 4,144,199, Cl. 252-522.000.

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van Loon, Hermanus; and Willems, Henricus G. A., 4,144,472, Cl. 313-217.000.

Willer, Sharon G.; Yust, Paul R.; and Kelly, Ralph, to Cincinnati Milacron, Inc. Method of inhibiting skin irritation. 4,144,319, Cl. 424-45.000.

Williams, Alverson B.; and Bodnar, Alfred D., to General Motors Corporation. Independent rear suspension system. 4,143,887, Cl. 280-697.000.

Williams, Benjamin C.: *See*—
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Williams, Marguerite R., to Surgical Appliance Industries, Inc. Sacrolumbar garment. 4,143,663, Cl. 128-527.000.

Williams, Michael: *See*—
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Williamson, Robert R.; and Derby, Norwin C., to Super Sack Manufacturing Corporation. Collapsible receptacle for flowable materials. 4,143,796, Cl. 222-185.000.

Wilson, Arland W. String tie and ornamental fastening. 4,143,422, Cl. 2-145.000.

Wilson, Charles D.: *See*—
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Wilson, John T. R. Variable frequency load platform and load limit switch. 4,143,726, Cl. 177-210.0FP.

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Winster Mining Limited: *See*—
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Winter, George R., III, to UOP Inc. Vapor circulation in hydrocarbon conversion processes. 4,144,280, Cl. 260-671.00R.

Winterbotham, Peter; and Hampson, Jeffrey D., to Lever Brothers Company. Liquid detergent compositions having improved drain-dry and mildness properties. 4,144,201, Cl. 252-547.000.

Winterbottom, Walter L., to Ford Motor Company. Fluxless braze processing of aluminum. 4,143,802, Cl. 228-217.000.

Wisconsin Alumni Research Foundation: *See*—
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Witt, James L.; and LaMore, Herbert T., to Colt Industries Operating Corp. Dual diaphragm choke assembly. 4,144,292, Cl. 261-39.00B.

Wochnowski, Waldemar; and Hohm, Reinhard, to Hauni-Werke Korber & Co. Kg. Method and apparatus for conditioning tobacco. 4,143,471, Cl. 34-28.000.

Wohlmut, Peter G.: *See*—
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Wong, Patrick S.: *See*—
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Wood, W. N. Lens polishing apparatus. 4,143,490, Cl. 51-58.000.

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Worrall, James D.: *See*—
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Worthington, Ralph E.; O'Neill, Padraic S.; and Hackett, Paul F. X., to Goulding Chemicals Limited. Production of hydrogen fluoride. 4,144,315, Cl. 423-490.000.

Wotruba, Gottfried, to Siemens Aktiengesellschaft. Circuit arrangement and operating process for converting an analogue signal into a digital signal. 4,144,526, Cl. 340-347.0AD.

Wren, John P., to Plessey Handel und Investments AG. Disc-record players. 4,143,879, Cl. 274-23.00R.

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Rawson, Eric G., 4,143,943, Cl. 350-120.000.
Stoffel, James C., 4,144,547, Cl. 358-260.000.
Tracy, Michael J., 4,143,960, Cl. 355-3.00R.
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Hara, Ryoichi; Yajima, Masamichi; Akai, Chiaki; and Matsumoto, Takuzo, 4,143,834, Cl. 242-158.00R.
Yajima, Tatsuo: *See*—
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Yamaguchi, Hiromasa, to Kabushiki Kaisha Komatsu Seisakusho. Turbine housing for centrifugal turbosupercharger. 4,143,994, Cl. 415-205.000.
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Yamamoto Electric Industrial Co., Ltd.: *See*—
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Yamamoto, Hisao: *See*—
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Yamanaka, Keio; Okamoto, Kazuo; and Mizukami, Yoshikatsu, to Kanebo, Ltd. Novel aromatic diamine compounds and flame-resistant polyamide compositions containing said compounds. 4,144,225, Cl. 260-45.9NC.
Yamashita, Seizi: *See*—
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Yaroshenko, Jury F.; Gonsales, Rodriges S.; Rogozhin, Sergei V.; and Misjurev, Vladimir I., to Vsesojuzny nauchno-issledovatelsky i experimentalno-konstruktorsky institut prodovolstvennogo mashinostroenia VNIEKIPRODMASH. Device for the production of granulated products from solutions or suspensions of food substances. 4,143,591, Cl. 99-483.000.
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Yatsu, Tadao; and Higashi, Isaburo, to Mitsui Petrochemical Industries, Ltd. Film-forming and thermocurable vinyl alcohol-substituted acrylamide copolymers and process for production thereof. 4,144,388, Cl. 526-9.000.
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Yeowell, David A.; and Swaringen, Roy A., Jr., to Burroughs Wellcome Co. Benzyl cyanoacetals. 4,144,263, Cl. 260-465.00D.
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Yoneyama, Masakazu; Inoue, Noriyuki; Tsuji, Nobuo; and Kameoka, Kimitaka, to Fuji Photo Film Co., Ltd. Method of image formation. 4,144,069, Cl. 96-63.000.
Yonezawa, Hiroichi, to Kabushiki Kaisha Yoneya Gangu. Drive mechanism for a running toy. 4,143,484, Cl. 46-104.000.
Yonezawa, Susumu; Torii, Yasuhiro; Ogiwara, Haruo; and Nakamura, Gisaku, to Nippon Telegraph and Telephone Public Corporation. Phase shifter for hologram recording. 4,143,937, Cl. 350-3.820.
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Yoshida, Ryo; Sumida, Seizo; Itooka, Eiyoshi; Noguchi, Hiroshi; and Kamoshita, Katsuzo, to Sumitomo Chemical Company, Limited. N-(4-Benzyloxyphenyl)-N-methyl-N-methoxyurea. 4,144,049, Cl. 71-120.000.
Yoshida, Shuji; and Kaihori, Hiroyoshi, to Kabushiki Kaisha Komatsu Seisakusho. Mounting apparatus of driver's cab for earth moving vehicle. 4,143,903, Cl. 296-35.00R.
Yoshihara, Mitsuo: *See*—
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Yoshikawa, Kunihiko, to Kabushiki Kaisha Yoshikawa Seisakusho. Holder apparatus for pulling-up wire in center pull type caliper brake. 4,143,745, Cl. 188-24.000.
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Young, Alastair J., to Automotive Products Limited. Vehicle fluid pressure braking system. 4,143,925, Cl. 303-22.00R.
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Young, Jerry W., to Phillips Petroleum Company. Container processing apparatus. 4,143,610, Cl. 113-113.00D.
Youngren, Fred R., to Raytheon Company. Rocket motor life indicator. 4,143,617, Cl. 73-358.000.
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Zaffignani, Giovanni; and Casalino, Carlo, to Ing. C. Olivetti & C., S.p.A. Multiprocessor system for automatic switching of telegraphic lines. 4,144,407, Cl. 178-50.000.
Zahedi, Karim; Alexander, Jeffery; and Zieve, Peter, to EFB Inc. Apparatus and method for controlling pollutant emissions and for enhancing the manufacture of asphaltic roofing. 4,144,359, Cl. 427-39.000.
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Zelahy, John W.; and Jones, Terry L., to General Electric Company. Method for metal bonding. 4,144,433, Cl. 219-9.500.
Zemans, Jeffrey T., to True Temper Corporation. Process for bleaching wooden articles. 4,144,089, Cl. 134-2.000.
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Ziaylek, Theodore, Jr., to Yardley Products Corporation. Metal insert. 4,143,579, Cl. 85-72.000.
Zieve, Peter: *See*—
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Zimmerman, James E., to United States of America, Navy. Cryogenic refrigeration system. 4,143,520, Cl. 62-6.000.
Zitting, Gordon T., to Poly-Seal. Mud pump piston. 4,143,586, Cl. 92-206.000.
Zoller, Karl; Werner, Dietmar; and Auer, Eberhard, to BASF Aktiengesellschaft. Production of aluminum salts of N-nitroso-N-alkylhydroxylamines. 4,144,260, Cl. 260-448.00R.
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Zschimmer, Gero. Method for measuring a voltage with the aid of an analogue-digital converter. 4,144,492, Cl. 324-103.00P.

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Zuvela, Bernard R.; and Teys, Raymond W., to Scientific Drilling Controls. Change in length of drill string containing an instrument. 4,143,721, Cl. 175-45.000.

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Barer, Sol J.: *See—*
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Bayer Aktiengesellschaft: *See—*
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Bopp, Warren G., to Eaton Corporation. Control for fluid coupling. Re. 29,928, Cl. 60-330.000.

Buchel, Karl H.: *See—*
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Celanese Corporation: *See—*
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Eastman Kodak Company: *See—*
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George, Henry H., Jr.; Barer, Sol J.; and Smart, Charles L., to Celanese Corporation. Delayed and sustained urea release compositions. Re. 29,933, Cl. 424-78.000.

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Illingsworth, Bernard D., deceased, to Eastman Kodak Company. Direct-positive silver halide emulsion fogged with low levels of reduction and gold fogging agents. Re. 29,930, Cl. 96-100.00N.

Norback, Per G., to Aktiebolaget Carl Munters. Catalytic purifier unit. Re. 29,932, Cl. 252-454.000.

Oliver, Rene A.: *See—*
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Zaiger, Chris F. Plum tree. 4,394, 3-13-79, Cl. 38.000.

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Barlew, Israel. Exercise platform or the like. 251,321, 3-13-79, Cl. D21-191.000.

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Becker, Robert L., to Dealers Truck Equipment, Inc. Unitized power outlet housing. 251,291, 3-13-79, Cl. D12-93.000.

Boissonneault, Therese C. Infant's bathtub. 251,303, 3-13-79, Cl. D23-52.000.

Bonazoli, Robert P.; and Morgan, William H., Jr., to GTE Sylvania Incorporated. Percussive flashlamp assembly. 251,328, 3-13-79, Cl. D48-33.000.

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Larson, Gerald M. Ordnance vehicle. 251,289, 3-13-79, Cl. D12-12.000.
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Paulin, Leo J. Putter head. 251,310, 3-13-79, Cl. D21-219.000.
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Vaughn, Steven D. Toy vehicle. 251,324, 3-13-79, Cl. D21-71.000.
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477 4,143,600

CLASS 106

1.17 4,144,074
38.8 4,144,075
47 Q 4,144,076
97 4,144,077
4,144,078
164 4,144,079
186 4,144,080
193 J 4,144,081
287.24 4,144,082
288 B 4,144,083
4,144,084
4,144,085
315 4,144,086

CLASS 108

35 4,143,601
117 4,143,602

CLASS 110

222 4,143,603

CLASS 112

152 4,143,604
158 E 4,143,605
4,143,606
209 4,143,607
210 4,143,608
262 4,143,609

CLASS 113

113 D 4,143,610

CLASS 114

90 4,143,611
219 4,143,612
230 4,143,613

CLASS 115

41 HT 4,143,614

CLASS 116

46 4,143,615
266 4,143,616

CLASS 118

603 4,143,618

CLASS 122

483 4,143,619

CLASS 123

3 4,143,620
32 B 4,143,624
32 EC 4,143,622
32 EE 4,143,623
32 EG 4,143,621
32 R 4,143,625
73 A 4,143,626
75 B 4,143,627
78 A 4,143,628
90.16 4,143,629
117 A 4,143,630
119 A 4,143,631
139 AQ 4,143,632
148 E 4,143,633
179 L 4,143,634
198 F 4,143,635

CLASS 124

40 4,143,636

CLASS 125

11 CC 4,143,637

CLASS 126

121 4,143,638
247 4,143,639
270 4,143,640
4,143,641
271 4,143,642
4,143,643
4,143,644
299 D 4,143,645
4,143,646
390 4,143,647

CLASS 127

24 4,144,087

CLASS 128

1 R 4,143,648
2 N 4,143,649
2.05 Z 4,143,650
20 4,143,652
87 A 4,143,653
87 R 4,143,654
90 4,143,655
130 4,143,656
152 4,143,657
184 4,143,658
214 C 4,143,659
303.1 4,143,660
349 B 4,143,651
419 R 4,143,661
477 4,143,662
527 4,143,663

CLASS 130

9 A 4,143,664
30 H 4,143,665

CLASS 131

2 4,143,666

CLASS 132

88.5 4,143,668

CLASS 134

2 4,144,088
4,144,089
3 4,144,090
6 4,144,091
12 4,144,092
13 4,144,093
153 4,143,669

CLASS 136

89 CC 4,144,094
89 P 4,144,096
89 PC 4,144,095
4,144,097

CLASS 137

72 4,143,670
4,143,671
81 4,143,672
115 4,143,673
151 4,143,674
615 4,143,675
625.23 4,143,676
875 4,143,677

CLASS 138

30 4,143,678

CLASS 139

383 R 4,143,679
384 B 4,143,680
435 4,143,681
4,143,682
450 4,143,683
4,143,684
456 4,143,685

CLASS 140

92.93 4,143,686

CLASS 141

1 4,143,687
104 4,143,688
207 4,143,689
333 4,143,690

CLASS 144

134 D 4,143,691
323 4,143,692

CLASS 145

76 4,143,693

CLASS 148

1.5 4,144,098
4,144,099
4,144,100
4,144,101
2 4,144,102
3 4,144,103
11.5 R 4,144,104
103 4,144,105
175 4,144,106

CLASS 149

60 4,144,107

CLASS 150

1.5 R 4,143,694
52 R 4,143,695

CLASS 151

41.75 4,143,696

CLASS 152

340 4,143,697

CLASS 156

60 4,144,108
73.1 4,144,109
73.5 4,144,110
161 4,144,115
187 4,144,111
313 4,144,112
334 4,144,113
414 4,144,114
611 4,144,116
617 SP 4,144,117
659 4,144,118
4,144,119

CLASS 160

120 4,143,698
176 R 4,143,699

CLASS 162

136 4,144,120
145 4,144,121

158 4,144,122
164 R 4,144,123
290 4,144,124

CLASS 164

187 4,143,700
368 4,143,701

CLASS 165

1 4,143,702
4,143,703
9.2 4,143,704
18 4,143,705
26 4,143,706
28 4,143,707
76 4,143,708
172 4,143,709
182 4,143,710
185 4,143,711

CLASS 166

72 4,143,712
241 4,143,713
252 4,143,714
271 4,143,715
274 4,143,716

CLASS 169

15 4,143,717

CLASS 172

705 4,143,718

CLASS 173

1 4,143,719

CLASS 174

52 PE 4,144,402
52 R 4,144,403
88 C 4,144,404

CLASS 175

5 4,143,720
9 Re.29,929
45 4,143,721
95 4,143,722
410 4,143,723

CLASS 176

38 4,144,125

CLASS 177

25 4,143,724
123 4,143,725
210 FP 4,143,726
211 4,143,727

CLASS 178

30 4,144,405
50 4,144,406
4,144,407

CLASS 179

2 EB 4,144,409
4,144,411
4,144,412
15 AL 4,144,410
15 BS 4,144,414
16 E 4,144,408
90 R 4,144,413
99 4,144,415
115.5 4,144,416
170.2 4,144,417

CLASS 180

1 G 4,143,728
5 R 4,143,729
33 D 4,143,730
64 A 4,143,731
68 P 4,143,732
69 R 4,143,733
77 R 4,143,734
91 4,143,735

CLASS 181

119 4,143,736
121 4,143,737
159 4,143,738
265 4,143,739

CLASS 182

93 4,143,740
198 4,143,741
201 4,143,742
206 4,143,743

CLASS 188

1 A 4,143,744
24 4,143,745

CLASS 191

12.4 4,143,746

CLASS 192

89 W 4,143,747
98 4,143,748

CLASS 194

1 N 4,143,749
97 R 4,143,750

CLASS 195

1.1 4,144,126
63 4,144,127
4,144,128
66 R 4,144,129
4,144,130
68 4,144,131
82 4,144,132
100 4,144,133
103.5 M 4,144,134
120 4,144,135
127 4,144,136

CLASS 198

365 4,143,751
4,143,752
370 4,143,753
379 4,143,754
456 4,143,755
457 4,143,756
494 4,143,757
624 4,143,758
688 4,143,759
750 4,143,760

CLASS 200

2 4,144,418
16 R 4,144,419
51 R 4,144,420
61.4 4,144,421
61.52 4,144,422
61.54 4,144,425
61.58 B 4,144,423
61.88 4,144,424
148 A 4,144,426
153 G 4,144,427
159 A 4,144,428
164 R 4,144,429
245 4,144,430
295 4,144,431

CLASS 203

46 4,144,138
65 4,144,137

CLASS 204

14 N 4,144,140
15 4,144,139
47 4,144,141
58 4,144,142
72 4,144,143
82 4,144,144
89 4,144,145
92 4,144,146
129 4,144,147
149 4,144,148
4,144,149
157.1 H 4,144,150
157.1 R 4,144,151
158 R 4,144,152
159.18 4,144,154
159.2 4,144,153
159.22 4,144,155
159.23 4,144,156
4,144,157
180 P 4,144,158
181 C 4,144,159
212 4,144,160
229 4,144,161

CLASS 206

106 4,143,761
210 4,143,762
334 4,143,763
429 4,143,764
445 4,143,765
453 4,143,766
582 4,143,767
590 4,143,768

CLASS 208

13 4,144,162

CLASS 209

12 4,144,163
4,144,164
544 4,143,769
558 4,143,770
583 4,143,771

CLASS 210

22 C 4,144,165
60 4,144,166
104 4,144,167
130 4,144,168
168 4,144,169
221 P 4,144,170
496 4,144,171
525 4,144,172
4,144,173
527 4,144,174

CLASS 211

59.1 4,143,772

CLASS 215

12 R 4,143,784
270 4,143,785
274 4,143,786

CLASS 219

9.5 4,144,432
4,144,433
10.55 E 4,144,435
4,144,438
10.55 F 4,144,434
4,144,436
4,144,437
60 A 4,144,439
61.5 4,144,440
74 4,144,441
106 4,144,442
137.7 4,144,443
383 4,144,444
532 4,144,445

CLASS 220

203 4,143,787
273 4,143,788
323 4,143,789
458 4,143,790

CLASS 221

75 4,143,791
97 4,143,792

CLASS 222

1 4,143,793
42 4,143,794
143 4,143,795
185 4,143,796
207 4,143,797

CLASS 224

42.42 R 4,143,800
243 4,143,798
301 4,143,799

CLASS 228

17.5 4,143,801
217 4,143,802

CLASS 229

27 4,143,803
42 4,143,804
44 R 4,143,805

CLASS 233

20 A 4,143,806

CLASS 234

3 4,143,807

CLASS 235

85 FC 4,144,446
92 PE 4,144,447
102 4,143,808
301 4,144,448
462 4,143,809
487 4,143,810

CLASS 236

1 G 4,143,811
48 R 4,143,812
51 4,143,813

CLASS 237

1 A 4,143,814
2 B 4,143,815
8 R 4,143,816
51 4,143,817

CLASS 238

349 4,143,818

CLASS 239

108 4,143,820
381 4,143,821
490 4,143,822
707 4,143,819

CLASS 241

73 4,143,823
282.1 4,143,824

CLASS 242

18 PW 4,143,825
54 R 4,143,826
55.3 4,143,827
65 4,143,828
68.2 4,143,829
72 R 4,143,830
107.4 A 4,143,831
129.62 4,143,832
158 R 4,143,833
4,143,834

CLASS 244

3.15 4,143,836
3.22 4,143,837
3.28 4,143,838
76 R 4,143,839
110 C 4,143,840
140 4,143,841
311 4,143,835

CLASS 246

182 B 4,143,842

CLASS 248

62 4,143,844
221.2 4,143,845
360 4,143,846
459 4,143,847
489 4,143,848
544 4,143,843

CLASS 249

11 4,143,849
135 4,143,852

CLASS 250

221 4,144,449
272 4,144,450
281 4,144,451
302 4,144,452
423 P 4,144,453
435 4,144,454
437 4,144,456
444 4,144,455
445 T 4,144,457
451 4,144,460
506 4,144,461
574 4,144,458
4,144,459

CLASS 251

28 4,143,850
29 4,143,851
149.1 4,143,853

CLASS 252

1 4,144,175
8.55 R 4,144,179
8.7 4,144,176
8.8 4,144,177
8.9 4,144,178
32.5 4,144,180
33 4,144,181
34 4,144,182
56 S 4,144,183
62.1 L 4,144,184
63.2 4,144,202
180 4,144,185
364 4,144,187
389 R 4,144,188
414 4,144,189
427 4,144,190
428 4,144,191
438 4,144,192
444 4,144,193
451 4,144,194
454 Re.29,932
455 R 4,144,195
455 Z 4,144,196
462 4,144,197
466 J 4,144,198
522 4,144,199
4,144,200
547 4,144,201

CLASS 254

93 HP 4,143,854
150 R 4,143,855
185 R 4,143,856

CLASS 256

11 4,143,857
49 4,143,859

CLASS 260

3.3 4,144,203
4 AR 4,144,204
7 4,144,205
9 4,144,206
23 H 4,144,214
23 S 4,144,207
27 R 4,144,208
29.2 M 4,144,209
29.2 N 4,144,210
29.2 R 4,144,211
29.7 H 4,144,212
30.2 4,144,213
31.2 N 4,144,215
31.2 R 4,144,216
31.8 W 4,144,217
32.6 R 4,144,218
33.2 R 4,144,220
33.4 SB 4,144,221
33.8 UB 4,144,219
37 SB 4,144,222
42.47 4,144,223
45.75 N 4,144,224
45.9 NC 4,144,225
112.5 R 4,144,228
123.5 4,144,229
157 4,144,230
4,144,231
239 A 4,144,232
239.3 B 4,144,233
239.3 P 4,144,234
239.3 T 4,144,235
244.4 4,144,237
302 SD 4,144,240
302.5 D 4,144,241
307 FA 4,144,242
308 A 4,144,243
326 C 4,144,244
326.43 4,144,246
326.5 FL 4,144,245
329 P 4,144,247
332.2 A 4,144,248
340.5 R 4,144,249
4,144,250
343.3 P 4,144,251
343.41 4,144,253
371 4,144,252
397.4 4,144,254
402.5 4,144,256
404.5 4,144,255
410.9 R 4,144,257
439 R 4,144,259
448 R 4,144,260
453 RW 4,144,261
463 4,144,262
465 D 4,144,263
465 G 4,144,264
4,144,265
505 R 4,144,267
505 S 4,144,266
513 N 4,144,268
545 R 4,144,269
562 R 4,144,270
564 R 4,144,271
567 4,144,272
590 C 4,144,273
4,144,274
666 A 4,144,277
666 B 4,144,278
668 R 4,144,279
671 R 4,144,280
683.48 4,144,281
683.68 4,144,282
836 4,144,283
857 PA 4,144,284
873 4,144,285
876 R 4,144,286
4,144,287
880 R 4,144,288
897 C 4,144,289
986 4,144,290
4,144,291

CLASS 261

39 B 4,144,292
93 4,144,293

CLASS 264

15 4,144,294
40.2 4,144,295
45.4 4,144,296
45.5 4,144,297
106 4,144,300
126 4,144,301
130 4,144,302
138 4,144,303
175 4,144,304
247 4,144,305
532 4,144,298
558 4,144,299

CLASS 266

49 4,143,860
4,143,861
56 4,143,862
118 4,143,863
158 4,143,864
161 4,143,865
216 4,143,866
272 4,143,867

CLASS 269

20 4,143,868
166 4,143,869

CLASS 270

47 4,143,870

CLASS 271

10 4,143,871

CLASS 272

99 4,143,872

CLASS 273

29 A 4,143,873
50 4,143,874
101 4,143,875
106.5 B 4,143,876
183 E 4,143,877
241 4,143,878

CLASS 274

23 R 4,143,879

CLASS 277

31 4,143,880
4,143,881
96.2 4,143,882
164 4,143,883
207 A 4,143,884

CLASS 280

477 4,143,885
624 4,143,886
697 4,143,887
4,143,888

CLASS 281

15 R 4,143,889

CLASS 282

27.5 4,143,890
4,143,891

CLASS 285

149 4,143,892
243 4,143,893

CLASS 289

1.2 4,143,894

CLASS 292

223 4,143,895
347 4,143,896
4,143,897

CLASS 293

137 4,143,898

CLASS 294

50.9 4,143,899
70 4,143,900
4,143,901

CLASS 296

35 R 4,143,903
57 A 4,143,904
65 R 4,143,905
84 D 4,143,906
137 B 4,143,908
137 C 4,143,907
167 4,143,902

CLASS 297

284 4,143,909
301 4,143,910
341 4,143,911
362 4,143,912
379 4,143,913
389 4,143,914
390 4,143,915
453 4,143,916

CLASS 299

2 4,143,917
43 4,143,918
59 4,143,919
79 4,143,920

CLASS 302

14 4,143,921
4,143,922

CLASS 303

22 R 4,143,923
4,143,924
4,143,925
92 4,143,926

CLASS 307

66 4,144,462
75 4,144,463
88.3 4,144,464
277 4,144,465

CLASS 310

13 4,144,466
49 R 4,144,467
72 4,144,468
156 4,144,469
198 4,144,470

CLASS 312

196 4,143,927
197 4,143,928

CLASS 313

60 4,144,471
217 4,144,472
315 4,144,473

CLASS 315

53 4,144,474
73 4,144,475
209 R 4,144,476
276 4,144,477
291 4,144,478
408 4,144,479
411 4,144,480

CLASS 318

331 4,144,481
381 4,144,482

CLASS 320

25 4,144,483

CLASS 323

19 4,144,484
44 R 4,144,485

CLASS 324

3 4,144,486
52 4,144,487
62 4,144,488
78 D 4,144,489
4,144,490
82 4,144,491
103 P 4,144,492
158 R 4,144,493
220 4,144,494

CLASS 325

4 4,144,495
53 4,144,496
302 4,144,497
464 4,144,498
470 4,144,499
480 4,144,500

CLASS 329

118 4,144,501

CLASS 330

207 A 4,144,502

CLASS 331

94.5 H 4,144,503
94.5 P 4,144,504
94.5 S 4,144,505

CLASS 333

26 4,144,506
181 4,144,509
191 4,144,507
4,144,508
241 4,144,510

CLASS 334

7 4,144,511
15 4,144,512

CLASS 335

46 4,144,513
229 4,144,514

CLASS 337

319 4,144,515

CLASS 338

2 4,144,516

CLASS 339

5 M 4,143,929
6 R 4,143,930
17 F 4,143,931
4,143,932
37 4,143,933
75 P 4,143,934
99 R 4,143,935
276 T 4,143,936

CLASS 340

1 L 4,144,517
3 PS 4,144,518
16 R 4,144,519
17 SP 4,144,520
59 4,144,521
146.1 BA 4,144,522
149 R 4,144,523
347 AD 4,144,525
4,144,526
4,144,527
500 4,144,528
562 4,144,529
566 4,144,530
575 4,144,531
585 4,144,532
754 4,144,524

CLASS 343

6.5 LC 4,144,534
7 AG 4,144,533
756 4,144,535

CLASS 346

33 F 4,144,536
140 R 4,144,537
153 4,144,538
160 4,144,539

CLASS 350

3.82 4,143,937
19 4,143,938
96.13 4,143,939
96.15 4,143,940
96.16 4,143,941
96.23 4,143,942
120 4,143,943
214 4,143,944
4,143,945
310 4,143,946
334 4,143,947
358 4,143,948

CLASS 351

160 H 4,143,949

CLASS 352

91 C 4,143,950
169 4,143,951
221 4,143,952

CLASS 353

27 R 4,143,953

CLASS 354

23 D 4,143,954
34 4,143,955
106 4,143,956
266 4,143,957
267 4,143,958
316 4,143,959

CLASS 355

3 R 4,143,960
5 4,143,961
10 4,143,962
14 4,143,963
30 4,143,964
35 4,143,966
35 C 4,143,965
77 4,143,967
83 4,143,968
100 4,143,969

CLASS 356

155 4,143,970
404 4,143,971

CLASS 357

30 4,144,540
4,144,541

CLASS 358

9 4,144,542
136 4,144,543
158 4,144,544
4,144,545
174 4,144,546
260 4,144,547

CLASS 360

59 4,144,548
78 4,144,549

CLASS 361

93 4,144,551
166 4,144,552
227 4,144,553
355 4,144,554
386 4,144,555

CLASS 362

16 4,144,556
84 4,144,557
255 4,144,558

CLASS 363

88 4,144,559

CLASS 364

107 4,144,550
113 4,144,560
200 4,144,561
4,144,562
4,144,563
4,144,564
4,144,565
4,144,566
405 4,144,567
410 4,144,568
414 4,144,569
4,144,570
450 4,144,571
487 4,144,572
506 4,144,573
561 4,144,574
562 4,144,575
564 4,144,576
571 4,144,577
575 4,144,578
607 4,144,579
707 4,144,580
827 4,144,581
900 4,144,582
4,144,583
4,144,584

CLASS 365

3 4,144,585
94 4,144,587
156 4,144,586
183 4,144,588
203 4,144,589
205 4,144,590
228 4,144,591

CLASS 366

25 4,143,972
54 4,143,973
78 4,143,974
147 4,143,975
165 4,143,976

CLASS 400

56 4,143,977
90 4,143,978
124 4,143,979
322 4,143,980
628 4,143,981

CLASS 401

28 4,143,667
280 4,143,982

CLASS 403

39 4,143,983
194 4,143,984
287 4,143,985
307 4,143,986
348 4,143,987

CLASS 404

26 4,143,988
72 4,143,989

CLASS 405

78 4,143,990
145 4,143,519
291 4,143,991

CLASS 414

170 4,143,777
330 4,143,775
411 4,143,779
460 4,143,781
620 4,143,780
672 4,143,782
694 4,143,778
715 4,143,783
735 4,143,776
745 4,143,774
787 4,143,773

CLASS 415

2 4,143,992
121 B 4,143,993
205 4,143,994

CLASS 417

3 4,143,995
15 4,143,996
50 4,143,997
366 4,143,488
413 4,143,998
424 4,143,999
462 4,144,000

CLASS 418

48 4,144,001
76 4,144,002
113 4,144,003
185 4,144,004
255 4,144,005

CLASS 422

56 4,144,306
131 4,144,307
159 4,144,186
245 4,144,308
305 4,144,309

CLASS 423

27 4,144,310
155 4,144,311
178 4,144,312
210 4,144,313
4,144,314
490 4,144,315
502 4,144,316

CLASS 424

21 4,144,317
40 4,144,318
45 4,144,319
48 4,144,320
49 4,144,321
4,144,322
54 4,144,323
4,144,324
59 4,144,325
70 4,144,326
78 Re.29,933
94 4,144,327
180 4,144,328
181 4,144,329
200 4,144,330
219 4,144,331
240 4,144,332
243 4,144,334
244 4,144,333
246 4,144,335
248.54 4,144,336
250 4,144,337
251 4,144,338
4,144,339
253 4,144,340
256 4,144,341
263 4,144,342
4,144,343
267 4,144,344
272 4,144,345
273 R 4,144,346
4,144,347
274 4,144,348
4,144,349
275 4,144,350
278 4,144,351
279 4,144,352

CLASS 425

33 4,144,006
34 R 4,144,007
66 4,144,008
79 4,144,009
125 4,144,010
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